

EUROMOD

COUNTRY REPORT



CROATIA (HR)

2017-2020

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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 covers the 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.

The European Commission is in the process of taking over responsibility for carrying out the annual update and release of EUROMOD. The transfer of responsibility is expected to be complete by the end of 2020 and the transition is being facilitated by close cooperation between the University of Essex and the Joint Research Centre (JRC) of the European Commission as well as Eurostat.

This report documents the work done in one annual update for Croatia. This work was carried out by the EUROMOD core developer team, based 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 I3.0. 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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<http://ec.europa.eu/social/easi>. The information contained within this document does not necessarily reflect the position or opinion of the European Commission.

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1. BASIC INFORMATION

1.1 Basic information about the tax-benefit system

- Public sector in Croatia consists of the general government and public enterprises. The general government has three levels: (a) the central government (CG) includes state ministries, budgetary and extrabudgetary funds, (b) the regional self-government (RSG) entails 20 counties and the City of Zagreb, and (c) the local self-government (LSG) involves 127 cities and 428 municipalities.
- Social security funds are part of CG. These funds are administered by three national social insurance funds – the Croatian Pension Insurance Institute (*Hrvatski zavod za mirovinsko osiguranje*; HZMO), the Croatian Employment Service (*Hrvatski zavod za zapošljavanje*; HZZ) and the Croatian Institute for Health Insurance (*Hrvatski zavod za zdravstveno osiguranje*; HZZO).
- The whole revenue from social insurance contributions (SIC; *doprinosi za obvezna osiguranja*) belongs to HZMO, HZZ and HZZO. The revenue from major tax sources – value added tax, excise taxes and corporate income tax – also belongs to the CG. The revenue from Personal income tax (PIT) is shared among RSG units, LSG units and the CG. There are several taxes that belong exclusively to RSG and LSG units.
- The cash social insurance benefits are paid by national social insurance funds. Major social assistance benefits are paid by the CG. LSG units provide their own social benefits, which top-up the existing CG benefits. The primary examples are the housing benefits and the lump-sum grants for newborn children. Some benefits are also provided by RSG units.
- The tax and benefit year is equivalent to the calendar year (runs from January 1 to December 31). January 1 is usually the date when changes in tax and benefit laws come into force. January 1 and July 1 are the dates when the “actual value of pension” is adjusted.
- In 2020 the statutory retirement age is 65 for men and 62½ for women. For women, the statutory retirement age gradually increases, and will reach 65 in 2030.
- In 2002 the Croatian pension system underwent a major reform, which introduced three pillars: (1) pillar 1 – intergenerational solidarity (*međugeneracijska solidarnost*), (2) pillar 2 – mandatory individual savings (*individualna kapitalizirana štednja*), and (3) pillar 3 – voluntary individual savings (*dobrovoljno mirovinsko osiguranje*). The savings in pillars 2 and 3 are collected by private pension funds. Two parallel contributory schemes are created: scheme A, whereby persons participate in pillar 1 only, and scheme B, whereby persons participate both in pillar 1 and pillar 2. Persons who were aged above 50 (below 40) in January 2002 are automatically involved into scheme A (B), while people aged between 40 and 50 could choose whether to become members of scheme A or B. People in scheme A pay contribution to pillar 1 only; this contribution is called Pension contribution A. Correspondingly, people in scheme B receive pension from pillar 1 only. People in scheme B pay contributions both to pillar 1 (Pension contribution B1) and to pillar 2 (Pension contribution B2).
- For certain groups of pension beneficiaries, special and more favourable rules apply concerning the statutory requirements for retirement and pension formulas. These groups include Croatian Defenders from the Homeland War, war veterans from the World War II, some groups of government officials, full members of Croatian academy of sciences and arts, etc.
- Children must remain in the primary education till the end of the school year during which they turn 15. School years last from September to June. Secondary school is not obligatory.

- Definitions of dependent children vary for purposes of different taxes and benefits. For the purposes of PIT and subsistence benefit, dependent children are those who are involved in regular primary, secondary or tertiary education. For Subsistence benefit the age limit is 29, while Child benefit sets the age limit at 19. PIT sets no specific maximum age.
- Large families are not recognised by current tax and benefit regulations; however, Child benefit provides a supplement for households with 3 or 4 children. For the purposes of Subsistence benefit a single parent is a parent who lives without a spouse; “lone parent” is a single parent whose spouse is dead or unknown. PIT does not recognise single or lone parents.
- PIT system is an individual system, with the spouses being assessed independently.
- In principle, PIT taxes market incomes and pensions, while non-pension social benefits are not taxable. Major taxable income sources are employment earnings, pensions, income from self-employment, income from contractual work, property income and capital incomes. Income from contractual work has both the properties of employment and self-employment income.
- The tax-benefit system recognises various groups of people according to their employment and income-earning status. The most relevant groups are: (a) *employed persons* – includes workers hired by employers as well as officials hired by CG/RSG/LSG institutions, (b) *self-employed persons* – those who regularly perform market activities as sole-merchants, craftsmen, entrepreneurs (firm owners), producers in agriculture (farmers), professionals (lawyers, dentists), artists, sportsmen, etc., (c) *temporary workers* – persons who are not employed through the standard labour contracts nor are self-employed persons; they earn income from contractual and occasional jobs, (d) *family workers in agriculture* – persons who work on family farms, but are not self-employed persons, (e) *pensioners* – persons whose primary income source is pension, (f) *unemployed persons* – see definition below, (g) *inactive persons* – those who are out of work, but not unemployed, pensioners or students.
- Besides the social benefits available to general public, there exist subsystems of special benefits, stemming from the Croatian Homeland War, World War II and peace-time military activities. Croatian Defenders from the Homeland War (*hrvatski branitelji iz Domovinskog rata*, HBDRs) are persons who have participated in the organized armed defence in the period from August 1990 to June 1996. Croatian military war invalids of the Homeland War (*hrvatski ratni vojni invalidi iz Domovinskog rata*, HRVI) are HBDRs who have suffered bodily damages of at least 20%, during the organised armed defence or imprisonment in hostile jail or camp. Passed away HBDRs (*smrtno stradali HBDR*) are HBDRs who were killed in organised armed defence or during the imprisonment in hostile jail or camp, or their death is closely related to defence activities. Further groups include civil invalids of the Homeland War or World War II (*civilni invalidi rata*; CIRs), invalids from the 2nd World War (*ratni vojni invalidi*, RVIs) and peace-time military invalids (*hrvatski mirnodopski vojni invalidi*, HMVIs). Various retirement, disability, survivor and social assistance benefits are available to the above mentioned groups or their family members.
- Employed persons receive gross wage (the so-called “gross-I wage”; *bruto-I plaća*). Employers’ SIC are paid upon the gross wage. The “gross-II wage” (*bruto-II plaća*) is equal to gross wage *plus* employers’ SIC. Employees’ SIC are paid out of the gross wage. Net wage is then equal to gross wage minus employees’ SIC minus PIT and LSG surtax.
- PIT has a general schedule, which is progressive, with two rates. Additionally, there are several income-source-specific schedules and a lump-sum taxation. The general schedule applies to income in yearly tax files, which is a sum of yearly self-employment income,

employment income, pensions and income from contractual work. The monthly-adjusted general tax schedule is derived from the general schedule and applies to employment income and pensions paid out on a monthly basis. Income-source-specific schedules are one-rate and apply to rental income, income from sale of assets, income from insurance and capital income. Lump sum taxation applies to minor groups of taxpayers, such as small entrepreneurs in agriculture and rental activities.

- The “current value of pension” (*aktualna vrijednost mirovine*, CVP) is used for calculation of new retirees’ pensions and for the adjustment of pensions of existing pensioners. CVP is revised twice a year (on January 1 and July 1), using an indexation rule which takes into account both the change in average gross wage and the consumer price index, in the preceding calendar year. The amounts of many social benefits are obtained as products of relevant coefficients and the so-called “budgetary base” (*proračunska osnovica*, BB), which is determined every year in the CG budget law. The amount of BB has remained constant through the period from 2002 to 2020, at 3,326 HRK. PIT brackets are not indexed, but are adjusted sporadically as part of PIT reforms.
- In calculations of some benefits and social insurance contributions the following indicators are used: (a) average gross wage from January to August of the previous year (AGWPY), (b) average net wage from January to August of the previous year (ANWPY), (c) average net wage from January to December of the previous year (ANWPY2), (d) gross minimum wage in the current year (GMW), (e) net minimum wage in the current year (NMW). The amounts of these indicators are presented in section 2.4.
- For PIT purposes incomes are assessed: (a) monthly, for income from regular employment and pensions, (b) yearly, for income from regular self-employment, and (c) at the moment of the occurrence, for all the remaining income sources. Income from the preceding calendar year is assessed for purpose of Child benefit. For purpose of Subsistence benefit, income from three months preceding the appraisal process.
- In principle, all residents are covered by the mandatory health insurance. Working groups of the population must pay health SIC, while CG pays the contributions for various non-working groups. Employed and self-employed persons are entitled to receive sickness benefits, maternity and parental leave benefits. Minimum insurance period conditions apply. Besides them, unemployed and inactive people are also entitled to receive parental benefits through schemes that are separate from maternity and parental leave benefits.
- A person is defined as unemployed if he/she is aged between 15 and 65, is able (or partially able) to work, is actively searching for a job and is available for work. To be considered as unemployed, a person should not: (a) perform work as self-employed or be the owner of an enterprise; (b) obtain monthly taxable income that is higher than the average unemployment benefit paid out in the preceding year; (c) be a regular student, or pensioner, or a person who satisfies the conditions for retirement. Other conditions apply.

All the tax and benefit rates provided below are those valid in June 30 of each respective year.

1.2 Minimum wage

Minimum wage law was first introduced in July 2008. The amount of gross minimum wage (GMW) was set to 39% of 2007 average gross wage, and equalled HRK 2,747. After that, GMW was adjusted each June 1, using the real GDP growth rate. According to the current law, introduced in 2014, the amount of minimum wage is set by the government, following the recommendation of the minister of labour. To determine the GMW for the next year, the minister of labour takes into account the trends in the economy and consults the social partners. New

minimum wage is set every January 1, whereby its nominal amount cannot decline. The amount of GMW for 2020 is HRK 4,063.

1.3 Social benefits

1.3.1 Retirement benefits

Full-age retirement pension (*starosna mirovina*) is obtained by a person who retires at the statutory retirement age and has at least 15 years of service (*mirovinski staž*). The level of pension depends on wages (or contributions) during the whole working period. A hypothetical man from scheme A, who has worked for 40 years, earning average gross wage in each year, and retires in January 2020, receives a pension of HRK 3,477 from pillar 1. Identical hypothetical worker in scheme B receives the “basic pension” of HRK 2,608 ($\frac{3}{4}$ of HRK 3,477) from pillar 1 and the additional pension from pillar 2.

Early-age retirement pension (*prijevremena starosna mirovina*) by a male (female) who retires at most five years before the statutory retirement age and has at least 35 (32½) years in service in 2020. For women, the minimum years of service gradually increase, and will reach 35 in 2030. The level of pension is also based on previous wages (or contributions), but a penalising factor is applied, equalling 0.3% for each month of early retirement.

For retirement and early retirement pensions, as well as for survivor and disability pensions described below, minimum and maximum pension rules apply. The *minimum pension* (*najniža mirovina*) is proportional to the years of service, and also depends on the type of pension. For a hypothetical male worker from scheme A, who retires in January 2020 at the statutory age with 40 years of service, the minimum pension amounts to HRK 2,738. The *maximum pension* (*najviša mirovina*) equals about 3 times the pension of the average worker.

As mentioned in section 1.1, for certain groups of pension beneficiaries, special and more favourable rules apply concerning the statutory requirements for retirement and pension formulas.

1.3.2 Survivor benefits

Survivor pensions

Family pension (*obiteljska mirovina*) is received by a widower of the passed-away insured person (PAIP), if the widower is above 50 or below 50, if unable to work or if taking care of children. A child of a PAIP is a beneficiary if involved in secondary or tertiary education; the age limit is 26, unless a person is unable to work. The pension amount is obtained as the *base* multiplied by a factor which depends on the number of survivors, and ranges from 0.7 for one survivor to 1.0 for four or more survivors. The base is equal to the PAIP’s last pension (if the PAIP was a pensioner) or to the eventual PAIP’s invalidity pension (if the PAIP was working). Certain minimum years of service are required.

As mentioned in section 1.1, for certain groups of pension beneficiaries, special and more favourable rules apply concerning the statutory requirements for retirement and pension formulas.

Special survivor benefits

There exists a range of survivor benefits related to family members of HBRDs, HRVIs, HMVIs, RVIs and CIRs, here referred to as **Special survivor allowances**.

1.3.3 Disability benefits

Disability pensions

Disability pension (*invalidska mirovina*) is obtained by persons with partial or full loss of working ability. Certain minimum years of service are required, depending on age. The pension amount is obtained as in the case of retirement pensions, however, the years of service are augmented by a certain factor. The amount also depends on whether a partial or full loss of working ability has occurred.

As mentioned in section 1.1, for certain groups of pension beneficiaries, special and more favourable rules apply concerning the statutory requirements for retirement and pension formulas.

General disability benefits

Supplement for assistance and care (*doplatak za pomoć i njegu*) is received by a person who needs assistance and care of another person in satisfying the basic living functions, such as preparing meals and feeding, house cleaning, dressing, personal hygiene, etc. Income and wealth means tests are applied. The amount of benefit equals HRK 420 or 600, depending on the level of disability.

Personal disability allowance (*osobna invalidnina*) is intended for persons with severe disability or other severe permanent changes in their health condition. Income and wealth means tests are applied. The beneficiary cannot obtain Supplement for assistance and care at the same time. The amount of benefit is HRK 1,500 minus income from other sources, excluding Subsistence benefit, Compensation for housing costs, Minimum pension, Child benefit, etc.

Pre-employment supplement (*naknada do zaposlenja*) is received by younger persons with severe disability or other severe permanent changes in their health condition, who have finished their education, are able to work and unemployed. The amount of benefit is HRK 350, and cannot be obtained simultaneously with the Supplement for constant care.

Benefits for caregivers

Compensation for caregiver (*naknada za roditelja njegovatelja ili za njegovatelja*) is received by parents or other family members who take care of persons who are completely dependent on the help of others, due to severe physical, mental or health disabilities. The amount of benefit is HRK 2,500. Additionally, social insurance contributions are paid on behalf of a caregiver.

Supplement for half-time employed caregiver of a child in need of additional care (*naknada tijekom rada s polovicom punog radnog vremena radi pojačane njege djeteta*) is received by employed or self-employed person until the age of a child is 3 years. The amount of benefit is HRK 2,328 (70% of BB).

Compensation for caregiver of a child with severe disability (*naknada tijekom dopusta radi njege djeteta s težim smetnjama u razvoju*) is obtained by employed or self-employed person until the age of a child is 8 years. The amount of benefit is HRK 2,328 (70% of BB).

Supplement for half-time employed caregiver of a child with severe disability (*naknada tijekom rada s polovicom punog radnog vremena radi njege djeteta s težim smetnjama u razvoju*) is similar to the previous benefit. The benefit amount for employed person equals the net wage obtained by caregiver at half-time work; for self-employed person it equals 50% of SIC base.

Work-related disability benefits

Salary compensation during a professional rehabilitation (*naknada plaće za vrijeme profesionalne rehabilitacije invalida rada*) is obtained by a disabled worker involved in the

program of professional education and prequalification. When the cause of disability is general (related to work injuries and occupational illness), the maximum duration of benefit receipt is 12 (24) months. The amount of the benefit is related to the disability pension that could be realised at the time of rehabilitation.

Supplement for physical impairment due to work injuries and occupational disease (*naknada zbog tjelesnog oštećenja uslijed ozljede na radu ili profesionalne bolesti*) is obtained by a person whom work injuries and occupational illness have caused physical damages. The amount of benefit depends on the degree of physical impairment, which is expressed as a percentage; e.g. for a 100% impairment, the benefit amounts to HRK 480.

Other benefits in this sub-group include the **Cash compensation for workers exposed to asbestos** (*novčana naknada radnicima izloženima azbestu*) and **Supplement for professional rehabilitation of HRVI** (*posebni doplatak za profesionalnu rehabilitaciju HRVI-a*).

Special disability allowances

There exists a range of disability benefits related to HBRDs, HRVIs, HMVIs, RVIs and CIRs, here referred to as **Special disability allowances**. They can be grouped into supplements for assistance and care, supplement for assistance at home and orthopaedic allowances.

1.3.4 Unemployment benefits

Unemployment benefit (*novčana naknada za vrijeme nezaposlenosti*) is received by unemployed persons who have worked for at least 9 months during the last 24 months; the termination of previous job post should not be voluntary or caused by worker's violations of working obligations; other conditions apply. The duration of benefit receipt increases with the insurance record: from a minimum of 90 days for less than 2 years spent in work to 450 days for people who have spent 25 or more years in work. For those having worked for more than 32 years and will satisfy the statutory age condition in less than five years, the duration of benefit is unlimited. For a person who has been using the benefit and then re-employed, the time spent in work is counted from the beginning of new employment. The amount of benefit is proportional to the benefit base, i.e. the average income earned in the 3-month period prior to unemployment. During the first 90 days the benefit is equal to 60% of the base, falling to 30% of the base for the rest of the period; maximum (minimum) levels apply. Since 01/2014, unemployment benefit is available also to self-employed persons.

Allowance and reimbursement of travel expenses for education and training of unemployed (*novčana pomoć i naknada troškova tijekom obrazovanja i osposobljavanja*) is received by unemployed persons who are involved in education and training programs organised or initiated by the HZZ. The benefit amount is related to the minimum amount of Unemployment benefit and the duration of the program. Additionally, related travel expenses are reimbursed.

Allowance during vocational training of unexperienced workers (*naknada za vrijeme stručnog osposobljavanja za rad bez zasnivanja radnog odnosa*) is introduced in 2012 and is intended for young unemployed persons to earn initial working experience. These persons work for employers without settling an employment contract. Beneficiaries receive net monthly allowance of HRK 3,000. Additionally, related social insurance contributions and travel expenses are reimbursed to employers. This measure is abolished in 2020; several other similar measures are introduced.

Several benefits are intended for unemployed persons who get employed in a place that is more than 80 kilometres away from their current place of residence. The benefits are obtained if the HZZ cannot find employment for these persons in their current place of residence, and if

employment lasts for at least one year (except in some cases). **One-time allowance for resettling unemployed** (*jednokratna novčana pomoć za nezaposlenu osobu*) amounts to HRK 1,200. **Reimbursement of travel and resettling expenses for resettling unemployed** (*naknada putnih i selidbenih troškova za nezaposlenu osobu*) is available for one-time travel of an unemployed person and her family members, at a maximum amount of HRK 300 per person (if employment last for less than 6 months, the benefit covers only the unemployed person). **Reimbursement of travel and resettling expenses for resettling unemployed** (*naknada putnih i selidbenih troškova za nezaposlenu osobu*) equals 50% of the cost of resettlement, with a maximum amount of HRK 1,000.

1.3.5 Sickness benefits

Sick-leave benefits are paid to insured employed and self-employed persons and temporary workers during the temporary work-break due to sickness and corresponding medical treatment.

Sickness benefit for employed and self-employed persons (*naknada plaće zbog privremene nesposobnosti ili sprječivosti za rad radi korištenja zdravstvene zaštite*). The cases of sick leave can be divided into three groups: (a) regular – related to illness and medical treatment, other than in cases mention below, (b) special – related to isolation due to infection, organ transplantations, escorting and nurturing of other sick persons, illnesses and complications related to pregnancy and childbirth, (c) work – related to injuries at work or occupational illness, (d) HBDR – related to wounds, injuries or illnesses that are the direct consequence of participation in the Homeland War. In case (a), the employer is obliged to pay the *salary replacement* for a time of 42 days after sick-leave has begun. After that period, HZZO pays the sickness benefit. In cases (b), (c) and (d), HZZO pays the benefit since the beginning of sick leave. The benefit base is obtained as the average “netted” gross wage or SIC base in the 6-month period prior to sick-leave. The minimum salary replacement is 70% of the benefit base. In case (a), the sickness benefit equals 70% of the benefit base, during the first 6 months of sick-leave; maximum (128% of BB) and minimum (25% of BB) limits apply. In cases (b), (c) and (d) the benefit equals 100% of the benefit base. Eligibility depends on the health insurance coverage. Preceding the event of sickness, the beneficiary must have been insured, either: (a) at least 9 months continuously, or (b) at least 12 months with interruptions during a 24 month period. If neither of these conditions is satisfied the benefit equals 25% of BB.

Sickness benefit for temporary workers (*novčana naknada zbog nemogućnosti obavljanja poslova na osnovi kojih se ostvaruju primitci od kojih se utvrđuje drugi dohodak prema propisima o porezu na dohodak*). Eligibility depends on the health insurance coverage. The benefit base is the average “netted” gross income from contractual work in the 6-month period prior to sick-leave; for eligibility, the benefit base must be greater than the floor employer SIC base. The benefit equals 70% of the benefit base and terminates after sick leave has begun.

Other sickness benefits are various reimbursements of costs, which incurred in relation to the use of health care or death of the medically treated person (travel costs, accommodation costs for child-caring parents during hospitalization, funeral expenses, etc.).

1.3.6 Family benefits

Benefits for parents, adoptive parents and foster parents

Maternity and parental benefits are intended for parents of newborn children. Effectively, all parents, whether working or not, can receive these benefits, but the duration and amounts are different. Three groups of parents are defined: (a) employed persons and self-employed persons, (b) temporary workers, workers in agriculture and unemployed persons, (c) inactive persons.

Group (a) receives Maternity leave benefit and Parental leave benefit. The base for these two benefits is equal to the average gross wage earned in the 6-month period prior to the work-break. Groups (b) and (c) receive Maternity and parental allowance, which does not depend on previous earnings. Analogous benefits are available to adoptive parents.

Maternity leave benefit (*naknada za rodiljni dopust*) is received by a mother who is employed or self-employed person, after the birth of a child (children). The leave is divided into mandatory and voluntary work-break period. The mandatory work-break period spans between the 28th day before the expected delivery date (or from the 45th day, upon medical approval) and the 70th day after the birth. The voluntary work-break period spans between the 70th day and the end of the 6th month after the birth. During both these periods the benefit is equal to the benefit base, which is income related. Minimum amount of benefit is HRK 2,328.20 (70% of BB). Maximum amount is not limited if the beneficiary satisfies the insurance period condition. Otherwise, the benefit equals the minimum amount.

Parental leave benefit (*naknada za roditeljski dopust*) is obtained by a mother or a father who are employed or self-employed persons, in the period after the end of the 6th month following the birth of a child. The benefit is received up to 6 months if only the mother uses the parental leave, or up to 8 months, if the father uses four months of parental leave. In cases when twins are born or if the 3rd or each subsequent child is born, the duration of benefit receipt can reach 30 months. The benefit base is the same as for the Maternity leave benefit. The amount of benefit in the first 6 (8) months is equal to the benefit base, with maximum set to HRK 3,991.20 (120% of BB). In the remaining period, i.e. after the 6th (8th) month, the benefit amounts to HRK 2,328.20 (70% of BB).

Maternity and parental allowance (*naknade za rodiljnu i roditeljsku brigu i poštudu od rada*) is available to parents of a newborn child who are temporary workers, workers in agriculture, unemployed persons or inactive persons. The benefit receipt starts with the child's birth and lasts for 12 months, or 36 months, if twins or the 3rd or each subsequent child are born. The amount of benefit is HRK 2,328.20 during the whole period of receipt.

Adoptive parent adoption leave benefit (*naknada za posvojiteljski dopust*) is obtained by adoptive employed or self-employed parents. The adoption leave begins with the moment of a child adoption and lasts for up to 6 months. The benefit amount is obtained analogously as in the case of Maternity leave benefit.

Adoptive parent parental leave benefit (*naknada za roditeljski dopust posvojitelja*) is obtained by adoptive employed or self-employed parents. The duration of the parental leave of adoptive parent and the amount of benefit are assessed analogously as for the Parental leave benefit, in the case of the 1st or the 2nd child's birth.

Support during the adopted child care (*naknade za posvojiteljsku brigu i poštudu od rada*) is the benefit intended to adoptive parents who are temporary workers, workers in agriculture, unemployed persons or inactive persons. The duration and the amount of the benefit are determined as for the Maternity and parental allowance, in the case of the 1st or the 2nd child's birth.

Compensation for accommodation of a child in a foster family (*naknada za smještaj djeteta u udomiteljsku obitelj*). The amounts of benefit for a pre-school and school child are HRK 1,800 (54.14% of BB) and HRK 2,000 (60.16% of BB). These amounts are supplemented for children with health impairment and disability.

Foster parent compensation (*osobna naknada udomitelju djeteta*) is a compensation for a foster caregiver. The benefit amount depends on the number and age of fostered children, and on

whether a foster caregiver is the legal supporter of children; the minimum amount for one child is HRK 400 (12% of BB).

Child benefits

Grant for a newborn child (*jednokratna novčana potpora za novorođeno dijete*) is received by all parents of newborn children and amounts to HRK 2,328 (70% of BB).

Child benefit (*doplatak za djecu*) is a means-tested benefit received by a parent or other person taking care of one or more children. The amount of benefit per child equals HRK 300 (9% of BB), HRK 250 (7.5% of BB), and HRK 200 (6% of BB), respectively, depending on household income per member, which cannot be higher than HRK 2,328 (70% of BB). Supplements are given for children without one or both parents and for children with impaired health. Substantial top-up amounts are given to households with three and four or more children, HRK 500 and 1,000, respectively; this is usually called the “pronatalist supplement” (“*pronatalitetni dodatak*”), but here we call it the “supplement for the 3rd and the 4th child”. Means-testing is not applied for two groups of children: (a) children with severe disability, for whom the benefit amount is HRK 832 (25% of BB), and (b) children of a killed, captured or missing HBDR, where the benefit amount is HRK 374 (11.25% of BB).

Temporary alimony (*privremeno uzdržavanje maloljetnog djeteta*) is obtained by a minor child who lives with a divorced parent. The parent, which does not live with a child, is the alimony tributary. In case that the tributary fails to pay the alimony, the obligation falls on the tributary’s parents, i.e., the child’s grandfather and grandmother. However, if they cannot pay the alimony, too, the Temporary alimony can be obtained from the government. The maximum duration of compensation is 3 years and ends when the child is 18.

1.3.7 Social assistance benefits

Subsistence benefit (*zajamčena minimalna naknada*) is a means-tested benefit intended for households whose income is below the “means of subsistence”. The latter represent the amount of money necessary to satisfy the basic needs of the particular household. They are obtained as a sum of individual contributions depending on household members’ characteristics. When calculating means of subsistence, children, the elderly and people unable to work are automatically accounted; working-able individuals between 18 and 65 are not taken into account unless they satisfy the conditions for being characterised as unemployed (see section 1.1).

This benefit was introduced in 1998 under the name Subsistence support (*pomoć za uzdržavanje*). In the period from 08/2007 to 05/2011 it was called Permanent support (*stalna pomoć*). However, in the whole period from 01/1998 to 12/2013 there were no important changes in the benefit design. In 01/2014 Subsistence support was replaced by the Guaranteed minimum benefit (*zajamčena minimalna naknada*), which introduces the following changes: (a) the contribution of children in the calculation of the “means of subsistence” is significantly lowered; (b) additional conditions for working-able individuals, (c) the wealth test is tightened, etc. Moreover, with the introduction of Guaranteed minimum benefit, two HBDR / HRVI / RVI / CIR related benefits were abolished (see below), and also the Extended unemployment benefit. Despite these changes the Guaranteed minimum benefit is treated here as a continuation of Subsistence support.

One-time assistance for household in need (*jednokratna naknada osobama u trenutačnim materijalnim poteškoćama*). Beneficiaries are households that cannot meet basic needs in certain occasions. The benefit serves to cover the expenses typically related to education, clothing, child birth, funeral expenses or transportation. The maximum yearly amount is equal to HRK 3,500 for a household. Exceptionally, upon approval of the ministry of social care, the benefit amount can reach up to HRK 10,000.

Compensation for housing costs (*naknada za troškove stanovanja*) is received for covering the costs of rent, electricity, gas, heating, water, and other housing bills. The benefit is financed and disbursed by LSG units, which also determine income tests and amounts of benefit. The maximum amount is equal to 50% of the amount of “means of subsistence”. Since 01/2014 it is explicitly defined that the beneficiaries must be receivers of Subsistence benefit. The recipients of Subsistence benefit also have the right to claim the **Firewood grant** (*naknada za ogrjev*), at typical amount of HRK 950, which is financed by RSG units.

Compensation for electricity costs (*naknada za ugroženog kupca energenata*) was introduced in 10/2015. Beneficiaries are households which receive Subsistence benefit, or households whose members receive Personal disability allowance. The amount of the benefit for a household is equal to the monthly cost of electricity, with maximum set at HRK 200.

Allowance for settlement of an adult person in a foster family (*naknada za smještaj odrasle osobe u udomiteljsku obitelj*). The amount of benefit for one fostered adult person is HRK 1,800 (54.14% of BB); the amount is increased for semi-mobile and immobile persons.

Personal allowance for a person performing adult foster care (*osobna naknada udomitelju odrasle osobe*) is a compensation for a foster caregiver. The benefit amount depends on the number and mobility of fostered persons.

Subsistence supplement for HBDR, HRVI and their family members (*opskrbnina za HBDR, HRVI i članove njihovih obitelji*) and **Subsistence supplement for RVI, CIR and their family members** (*opskrbnina za RVI i CIR*) were means-tested subsistence income schemes, intended for special groups of beneficiaries. They were abolished in 01/2014, with the introduction of the Guaranteed minimum benefit. Since 2018, a similar benefit is reintroduced for non-employed HBDRs and their family members (*naknada za nezaposlene hrvatske branitelje iz Domovinskog rata i članove njihovih obitelji*).

1.3.8 Benefits provided by local and regional self-government units

As mentioned in section 1.3.7, LSG units provide Compensation for housing costs, while RSG units deliver Firewood grant. Most LSG units, as well as some RSG units, provide their own lump-sum grants for newborn children. In some cases, they are more generous than the grant paid from the central government; e.g. in the City of Zagreb, the amount is HRK 1,800 for the 1st child, HRK 3,600 for the 2nd child and HRK 54,000 for each subsequent child. However, the mode value is HRK 1,000. LSG units also provide: (a) cash supplements to low income pensioners, people with disability, unemployed, etc., (b) subsidies for transportation costs for various groups of citizens (pensioners, unemployed, people with disability, school children, etc.), (c) subsidized pre-school day care programs (kindergartens), (d) lump-sum benefits and food packages for the poor, (e) various benefits for school children and students (grants, subsidies for school books, school meals, etc.).

1.4 Social insurance contributions

1.4.1 Types of social insurance contributions and payers

The social insurance contributions system defines (a) several types of contributions, and (b) a range of income sources, income earning activities and occupations, that are subject to payment of SIC.

The main types of contributions are:

General health contribution (*doprinos za zdravstveno osiguranje*). Since 01/2019 the rate is 16.5%. Before this change, the rate was 15%, except in the period from 05/2012 to 03/2014, when it equalled 13%.

Occupational health contribution (*doprinos za zdravstveno osiguranje zaštite zdravlja na radu*). This contribution is abolished in 01/2019. Until 12/2018 the rate was 0.5%.

Pensioner health contribution (*dodatni doprinos umirovljenika za zdravstveno osiguranje*). The rates are 1% and 3%.

Employment contribution (*doprinos za obvezno osiguranje u slučaju nezaposlenosti*). This contribution is abolished in 01/2019. Until 12/2018 the rate was 1.7%.

Pension contribution A (*doprinos za prvi stup mirovinskog osiguranja*) is the contribution to pillar 1, paid by persons in contributory scheme A. The rate is 20%.

Pension contribution B1 (*doprinos za prvi stup mirovinskog osiguranja*) is the contribution to pillar 1, paid by persons in contributory scheme B. The rate is 15%.

Pension contribution B2 (*doprinos za drugi stup mirovinskog osiguranja*) is the contribution to pillar 2, paid by persons in contributory scheme B. The rate is 5% (persons in contributory scheme A do not pay contributions to pillar 2).

Thus, a person pays either Pension contribution A, or the sum of Pension contribution B1 and Pension contribution B2. The overall rate of Pension contributions is 20% in both cases.

In the next few sections we define four main groups of persons who must pay SIC because they are earning certain source of income or performing certain occupational activities.

1.4.2 Wage related social insurance contributions

Employment earnings are subject to employer and employee SIC. The contribution base is equal to the gross employment earnings.

Until 12/2018, employer SIC included General health contribution, Occupational health contribution and Employment contribution. Since 01/2019, employer SIC includes General health contribution only.

Employee SIC involve Pension contributions (A, B1, B2).

1.4.3 Social insurance contributions for self-employed persons

These contributions are paid by self-employed persons. The contribution base is not income related, but is a lump-sum obtained as some percentage of the average gross wage of the previous year (from January to August). This percentage ranges from 35% to 110% for various types (occupations). Until 12/2018, self-employed persons paid General health contribution, Occupational health contribution, Employment contribution and Pension contributions (A, B1, B2). Since 01/2019, Occupational health contribution and Employment contribution are not paid.

1.4.4 Social insurance contributions on income from contractual work

SIC are also paid on income from contractual work. These contributions are mimicking the system of employer and employee contributions. In that respect, there is a part of contributions paid by the purchaser of services (“employer”) and a part paid by the provider of services (“employee”). The contribution base is equal to the “gross receipt”, which is an equivalent of “gross wage”.

General health contribution is paid by the “employer”, while the earner of contractual income pays Pension contributions (A, B1, B2). Before 2017, some types of income from contractual work were exempt from SIC, e.g., honoraria for original works of scientists, journalists, artists, etc. Furthermore, income from contractual work of pensioners was also exempt from SIC. In 01/2017 important changes have been introduced, in order to equalise the treatment of different groups of persons who perform contractual work. All earners have to pay SIC, whose rates are set to one half of regular rates from section 1.4.1.

1.4.5 Pensioner health contribution

Pensioners who receive domestic pensions pay Pensioner health contribution. The contribution base is the monthly gross pension.

1.5 Taxes

1.5.1 Consumption taxes

Value added tax (*porez na dodanu vrijednost*) exists since 1998. Following the accession of Croatia in EU, in July 2013, VAT became fully harmonised with EU VAT. Taxpayer is every person engaged in the provision of goods and services. The tax base is the value of (a) goods and services provided by a taxpayer within the territory of Croatia, (b) goods and services purchased by a taxpayer from providers residing in other EU countries, and (c) goods and services purchased (i.e., imported) from countries outside the EU. The standard VAT rate is 25%. A minimum rate of 5% applies to bread, milk, medical drugs, equipment and appliances for persons with disability, newspapers (certain types), books (with scientific, educative, cultural content), scientific journals. A reduced rate of 13% applies to a range of commodities and services, including: (a) accommodation services in hotels, camps and tourist boats, (b) certain types of newspapers, concerts tickets, culture and art magazines, (c) fresh meat, fish and eggs; edible oils and fats, (d) child car-seats, baby food, baby diapers, (e) water and electricity supply services, collection of municipal waste services, (f) some agricultural products (seedlings and seeds, fertilizers, pesticides).

Excise taxes (*posebni porezi na dobra i usluge, trošarine*). Taxpayers are producers and importers of different goods. The subjects of taxation are: (a) motor vehicles for personal uses, (b) coffee products, (c) alcoholic and non-alcoholic beverages, (d) tobacco products, (g) energy products and electricity. Before 2013 there existed also excise taxes on vessels and aircrafts for personal use, on luxury products, beer, etc.

Beverages tax (*porez na potrošnju pića*). Taxpayers are providers of bar and restaurant services. The tax base is the sale price of served beverages.

1.5.2 Income taxes

Corporate income tax (*porez na dobit*). Taxpayers are principally legal entities performing economic activities for profit. Individual entrepreneurs (self-employed persons) are also subject to taxation in certain cases, or they can voluntarily choose to pay Corporate income tax instead of Personal income tax. The tax base is profit (the difference between revenues and expenditures) determined pursuant to the accounting regulations, increased and reduced in accordance with certain provisions determined by the law. The tax rate was 20% in 2016. Since 01/2017 the tax rate is 18%, and 12% for entities whose yearly revenue is below HRK 3 million.

Personal income tax (*porez na dohodak*). Taxpayers are individuals earning income from taxable sources, the main of which are employment earnings, income from self-employment, pensions,

property income, capital income and income from contractual work. General schedule has four rates till 06/2010 (15%, 25%, 35% and 45%) and three rates (12%, 25% and 40%) since 07/2010. Since 01/2017 the number of rates is reduced to two (24% and 36%). In 2012, taxation of dividends was introduced; since 2015 interest income is also taxable; since 2016 capital gains are taxable. All types of income, except self-employment income, are taxed by withholding during the year; employment income and pensions are taxed using the monthly-adjusted general tax schedule, while other sources are taxed by income specific schedules.

Regarding the yearly tax, taxpayers are divided into those who: (a) *must* submit a yearly tax file (YTF); these are primarily self-employed persons, (b) *may* submit YTF, in order to achieve even taxation throughout the year and use yearly allowances and deductions, (c) *cannot* submit YTF. The yearly general schedule is applied to income reported in YTF. Prior to 01/2017 virtually *all* income sources had to be reported in YTF. Since 01/2017, YTF covers only the selected forms of income, i.e. self-employment income, employment income, pensions and income from contractual work. In mid-2010 several deductions were abolished, namely for insurance premiums, housing and health expenses; the current system has relatively few deductions, e.g., for given donations and for self-employed persons. There are several deductions for inhabitants of less developed and war stricken areas.

Surtax (*prirez*) is paid by PIT taxpayers. The tax base is the amount of PIT. LSG units set the level of the rate. The maximum rates can be set to: (a) 10% in municipalities, (b) 12% in cities with a population below 30,000, (c) 15% in cities with a population over 30,000, except (d) 30% in Zagreb (where the current rate is 18%).

1.5.3 Property taxes

Currently there is no standard property tax in Croatia. Its role is in certain way played by the Communal fee (*komunalna naknada*), which is paid by the owners and users of immovable property. The amount of the fee depends on the city (municipality) zone, the type of the property and the surface area.

There are several taxes on different types of assets held and used by natural and legal persons. Among them, intermittent taxes are Inheritance and gifts tax (*porez na nasljedstva i darove*) and Real estate transfer tax (*porez na promet nekretnina*). Regular taxes are Tax on vacation houses (*porez na kuće za odmor*), Tax on road motor vehicles (*porez na cestovna motorna vozila*), Tax on vessels (*porez na plovila*), Trade name tax (*porez na tvrtku ili naziv*) and Tax on the use of public land (*porez na korištenje javnih površina*).

1.6 Covid-19 related policies

In the period from mid-March till the beginning of April 2020, the Croatian government introduced two packages of economic measures to alleviate negative impacts of the Covid-19 pandemic. There is almost one hundred of these measures, which vary greatly regarding their coverage, budget expense and potential effects on economy.

Wage compensation or *Job preservation grant* (*potpora za očuvanje radnih mjesta*) is obtained by entrepreneurs belonging to one of the following groups: (a) entrepreneurs whose operation was temporarily stopped or significantly impeded by decisions of the relevant authorities; (b) entrepreneurs engaged in accommodation and food and beverage service activities, transportation and storage activities and labour-intensive activities within the manufacturing industry (textiles, clothing, footwear, leather, wood and furniture); and (c) other businesses able to provide evidence of being affected by Covid-19 related circumstances. With certain exceptions, firms established or owned by CG, RSG and LSG are excluded from the program. The policy is administered by

the HZZ. The compensation is intended for employees and for self-employed as well. In this form the program will exist during the three-month period, from March to May 2020. The program is continued in July, but the circle of eligible industries is much narrowed. The net amount of wage compensation is HRK 3,250 in March, and HRK 4,000 in April and May. Entrepreneurs are exempted from paying social insurance contributions regarding the compensation. Instead, HZZ pays Pension contribution B on behalf of the beneficiaries.

Exemption for payment of taxes and social insurance contributions (*oslobođenje od plaćanja poreza i obveznih doprinosa*) is available to entrepreneurs, whose revenue from March 20 to June 20, 2020, fell by 50% or more in comparison to the same period in 2019. Taxes that can be exempted are corporate income tax, personal income tax and surtax. Exemption is not available for value added tax, excise taxes, customs duties, and for personal income tax and surtax paid on capital and rental income. Exemption of social insurance contributions does not include Pension contribution B2. Full or 100% exemption is available for entrepreneurs whose total revenue (net of value added tax) in 2019 was below HRK 7.5 million; otherwise, exemption is proportional to the fall of revenue. Specifically, exemption for renters of tourist accommodation units equals one quarter of their lump-sum PIT (see “renters III” in section 2.7.3).

Value added tax deferral (*odgoda plaćanja poreza na dodanu vrijednost*) is available to all entrepreneurs, under following conditions: (1) monthly revenue fell by at least 20% lower in comparison to the same month of 2019; alternatively, it should be proved that the revenue in the next three months will be by at least 20% lower in comparison the same period in 2019; (2) for tax due, it must be proved that the tax obligation arises from issued and incoming invoices that have not been settled (i.e., paid).

Some of **other measures** include:

- (a) Stand-still measure, i.e., suspension of execution of all coercive measures against all debtors (legal or natural persons) within three months;
- (b) Croatian Bank for Reconstruction and Development (*Hrvatska banka za obnovu i razvoj*) introduced moratorium on existing repayments, enabled loan reprogramming, introduced new loans for liquidity, etc. Similar measures taken by Croatian Agency for SMEs, Innovations and Investments (*Hrvatska agencija za malo gospodarstvo, inovacije i investicije*);
- (c) Grants for independent artists to whom contributions are paid from the state budget. Net monthly amount is HRK 1,625 (HRK 3,250) for those with average monthly income in 2019 below (above) HRK 1,625.

2. SIMULATION OF TAXES AND BENEFITS IN EUROMOD

2.1 Scope of simulation

EUROMOD is a cross-country comparative benefit-tax model. The model simulates a variety of taxes and benefits. However, not all taxes and benefits mentioned in section 1 are simulated. Some are entirely beyond the scope of the model, and are not included either in the EUROMOD input database or as output variables, while others are included as non-simulated output variables. Table 2.1 and Table 2.2 classify the main tax and benefit instruments according to how each is treated in EUROMOD, and provide a brief explanation as to why the instrument is not fully simulated when this is the case.

Table 2.1 Simulation of benefits in EUROMOD

	Variable name	Treatment in EUROMOD				Why not fully simulated
		2017	2018	2019	2020	
Retirement benefits/pensions						
Old age pension	poa	I	I	I	I	1
Survivor pension	psu	I	I	I	I	1
Disability pension	pdi	I	I	I	I	1
Unemployment benefits						
Unemployment benefit	bunct_s	PS	PS	PS	PS	1
Other unemployment benefits	bunot	I	I	I	I	2
Covid-19 compensation	bwkmc_s	-	-	-	NBS	
Family benefits						
Child benefit	bch_s	S	S	S	S	
Sickness – maternity benefits						
Sickness benefits	bhl	I	I	I	I	2
Maternity leave benefit	bfama_s	S	S	S	S	
Parental leave benefit	bfapl_s	S	S	S	S	
Maternity and parental allowance	bmanc_s	S	S	S	S	
Grant for a newborn child	bfaba_s	S	S	S	S	
Social assistance benefits						
Subsistence benefit	bsa_s	S	S	S	S	
Other social assistance benefits	bsaot	I	I	I	I	2
Housing benefits						
Compensation for electricity costs	bhout	S	S	S	S	
Compensation for housing costs	bho	I	I	I	I	2
Education allowances	bed	I	I	I	I	2
Disability benefits	bdi	I	I	I	I	2
Old-age benefits	boa	I	I	I	I	2
Survivor benefits	bsu	I	I	I	I	2
Minimum wage	yem	S	S	S	S	

Notes: 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;
 NBS: *simulated* but not included in the baseline;
 1: no data on contribution history;
 2: data available not sufficient to simulate all eligibility conditions.

Table 2.2 Simulation of taxes and social insurance contributions in EUROMOD

	Variable name	Treatment in EUROMOD				Why not fully simulated
		2017	2018	2019	2020	
Taxes						
Personal income tax	tin_s	S	S	S	S	
Surtax	tmu_s	S	S	S	S	
Property taxes	tpr	I	I	I	I	2
Social insurance contributions						
Employers	tscer*_s	S	S	S	S	
Employees	tscee*_s	S	S	S	S	
Pensioners	tscbesi_s	S	S	S	S	

Income from self-employment and contractual work	tscse*_s	S	S	S	S
Credited SIC	tscct_s	S	S	S	S

Notes: I: *included* in the micro-data but not simulated;
 S: *simulated* although some minor or very specific rules may not be simulated;
 2: data available not sufficient to simulate all eligibility conditions.

- ***Structural changes between 2017 and 2018***

(a) Changes in family benefits: (1) the minimum amounts of Maternity leave benefit, Parental leave benefit and Maternity and parental allowance have been raised by 40%; (2) the maximum amount of Parental leave benefit for the first 6 (8) months is increased by 50%; the benefit amount for the rest of duration period is increased by 40%.

(b) Within employer social insurance contributions a new deduction is introduced for employees whose gross employment earnings are equal to GMW or less. In these cases, the contribution base is reduced by 50%.

- ***Structural changes between 2018 and 2019***

(a) Changes in employer social insurance contributions: Occupational health contribution and Employment contribution are abolished since 01/2019, while the rate of General health contribution is raised from 15% to 16.5%.

(b) Changes in Child benefit: in 07/2018 the top threshold was raised from HRK 1,663 (50% of BB) to HRK 2,328.20 (70% of BB).

(b) Changes in Personal income tax: the upper monthly limit of the first income band is increased from HRK 17,500 to 30,000.

- ***Structural changes between 2019 and 2020***

(a) Changes in family benefits: the maximum amount of Parental leave benefit is increased to HRK 5,654.20 in 04/2020;

(b) Changes in Personal income tax: (a) basic personal allowance is increased from HRK 3,800 to HRK 4,000; (b) tax relief is introduced for employment income of workers younger than 30.

2.1.1 Part-simulated tax-benefit components

The unemployment benefit (bunct_s) is part-simulated; as not all required information (e.g. unemployment history) is available in the SILC data, benefit recipients are imputed using information on the reported receipt of the respective benefit in the SILC data. Therefore, the benefit simulation is conditional on the reported benefit receipt in the micro-data.

2.2 Order of simulation and interdependencies

The following table shows the order of policies' simulation in the Croatian system in 2017-2020. The spine starts by setting default values for some variables. Then there is a policy to uprate all monetary variables up to 2020 (for uprating factors see section 3.4). Next, constants, income lists and tax units are defined. The policy spine begins with the simulation of the minimum wage, which changes employment income for those observed below the legal limit. This policy is switched off in the baseline scenario. After that, the model recodes all negative self-employment income to zero. Social insurance contributions, levied on employment and self-employment

income, come next. They are followed by personal income tax, maternity and paternal benefits and the unemployment insurance benefit. The last elements of the spine include untaxed benefits, credited social insurance contributions and the surtax.

Note that maternity and parental benefits depend on beneficiaries' net wage. At the same time, they are also needed for the simulation of personal income tax (in the calculation of personal allowance for supported family members). Therefore, the PIT policy is run twice: first with these benefits set to zero and then again with the benefits' final values.

Table 2.3 EUROMOD Spine: order of simulations

Policy	2017	2018	2019	2020	Description of policies
SetDefault_hr	on	on	on	on	DEF: Default values for variables
Uprate_hr	on	on	on	on	DEF: Uprating factors
ConstDef_hr	on	on	on	on	DEF: Constants
ilsdef_hr	on	on	on	on	DEF: Standardised income lists
ilsUDBdef_hr	on	on	on	on	DEF: UDB-related standardised income lists
ildef_hr	on	on	on	on	DEF: Non-standardised income lists
selfemp_hr	on	on	on	on	DEF: variables defining self-employed persons
random_hr	on	on	on	on	DEF: Random variables
TransLMA_hr	n/a	n/a	n/a	off	DEF: Modelling labour market transitions
tundef_hr	on	on	on	on	DEF: Assessment units
yem_hr	switch	switch	switch	switch	DEF: Minimum wage
neg_hr	on	on	on	on	DEF: Recode negative self-employment income to zero
InitVars_hr	on	on	on	on	DEF: Initialise variables
covidcomp_hr	n/a	n/a	n/a	on	BEN: Covid-19 wage compensation: amounts
tscer_hr	on	on	on	on	SIC: Employers
tscee_hr	on	on	on	on	SIC: Employees
tsce00_hr	on	on	on	on	SIC: Self-employed
tsce01_hr	on	on	on	on	SIC: Income from contractual work
tscbesi_hr	on	on	on	on	SIC: Pensioners
tin_hr	on	on	on	on	TAX: Personal income tax
bfaba_hr	on	on	on	on	BEN: Grant for a newborn child
bfama_hr	on	on	on	on	BEN: Maternity leave benefit
bfapl_hr	on	on	on	on	BEN: Parental leave benefit
bmanc_hr	on	on	on	on	BEN: Maternity and parental allowance
bunct_hr	on	on	on	on	BEN: Unemployment benefit
Def_hr	on	on	on	on	DEF: Update tax unit used in tin_hr
tin_hr	on	on	on	on	TAX: Personal income tax (repetition of policy with order 20)
tmu_hr	on	on	on	on	TAX: Surtax
tsct_hr	on	on	on	on	SIC: Credited
bch_hr	on	on	on	on	BEN: Child benefit
bsa_hr	on	on	on	on	BEN: Subsistence benefit
bhout_hr	n/a	n/a	on	on	BEN: Compensation for electricity costs
output_std_hr	on	on	on	on	DEF: Standard output individual level
output_std_hh_hr	off	off	off	off	DEF: Standard output household level

2.3 Policy switches

Policy switches (or ‘extensions’) are indicated by little coloured symbols in the row-number column of the spine. Switchable policies can be turned ON or OFF through the run dialog box without changing the model itself. In the baseline a switchable policy is set to its default (ON or OFF) as specified in this documentation.

The Croatian model uses three global extensions. UAA allows choosing between two alternative approaches to pension uprating. By default (i.e., in the baseline), old-age, survivor and disability pensions are uprated according to pension indexation rules. As an alternative, pensions can be uprated according to their average yearly growth. BTA enables two approaches regarding the take-up of Subsistence benefit. By default, the amounts below a certain threshold are *not* claimed. Alternatively, the benefit is taken up by *all* beneficiaries with positive benefit amounts. Finally, the MWA extension allows for switching on and off the minimum wage policy (yem_hr). By default, this policy is switched off.

2.4 Important indicators

In calculations of some benefits, personal income tax and social insurance contributions the following indicators are used: (a) “budgetary base” (BB), (b) official average gross wage in the current year (AGW), (c) average gross wage from January to August of the previous year (AGWPY), (d) average net wage from January to August of the previous year (ANWPY), (e) average net wage from January to December of the previous year (ANWPY2), (f) gross minimum wage in the current year (GMW), (g) net minimum wage in the current year (NMW), (h) Regular basic personal allowance (RBPA), (i) Maximum pensioner’s basic personal allowance (MPBPA), and (j) Personal allowance base (PAB). The 2020 figure for AGW is a prediction (see note N2 in Table 3.3).

Table 2.4 Indicators used in calculations of some benefits, personal income tax and social insurance contributions (2017-2020), HRK per month

	2017	2018	2019	2020
BB	3,326	3,326	3,326	3,326
AGW	8,055	8,448	8,766	8,985
AGWPY	7,739	8,020	8,448	8,742
ANWPY	5,664	5,960	6,237	6,434
ANWPY2	5,685	5,985	6,242	6,457
GMW	3,276	3,440	3,750	4,063
NMW	2,621	2,752	3,000	3,250
RBPA	3,800	3,800	3,800	4,000
MPBPA	3,800	3,800	3,800	4,000
PAB	2,500	2,500	2,500	2,500

Sources: Croatian Bureau of Statistics; Ministry of Finance; Tax administration.

2.5 Minimum wage

- *Brief description*

The minimum wage determines the minimum legally allowed gross monthly wage for full-time work.

- *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.

- **Benefit amount**

The amounts of gross minimum wage in 2017-2020 are shown in Table 2.4; see item GMW.

2.6 Social benefits

2.6.1 Subsistence benefit (*bsa_s*)

- **Brief description**

Subsistence benefit is a means-tested benefit intended for households whose income is below the “means of subsistence”.

- **Definitions**

The considered unit is a “household” (*kućanstvo*), which is “the family or other community of people who live together and settle living expenses together, regardless of kinship”.

- **Eligibility conditions**

Eligible household members are all persons aged below 15 and above 65.

In order to qualify as eligible household members, persons aged between 15 and 65 must satisfy the conditions for being characterised as unemployed, except in cases when a person is:

- unable to work;
- taking care of a child up to age of 1 year;
- taking care of twins up to age of 3;
- taking care of 3 or more children all aged below 10;
- taking care of a person with physical, mental or health impairments;
- those whose age is above the ‘statutory pension age *minus* 5 years’.
- aged between 15 and 29 and involved in regular education;
- pregnant, from the beginning of pregnancy.

- **Income test**

Household income is the sum of incomes of all household members, both of eligible and non-eligible ones. Household income must be lower than its “means of subsistence” (*sredstva uzdržavanja*). The household’s “means of subsistence” are a sum of contributions of eligible household members. These contributions depend on personal characteristics of each member, and are presented by the following table:

Table 2.5 Means of subsistence: amounts (2017-2020), HRK per month

	2017-2020
<i>Adult in a one-member household</i>	
Able to work	800
Unable to work	920
<i>Adult in a multiple-member household</i>	
Able to work	480

Unable to work	480
<i>Lone parent</i>	
Able to work	800
Unable to work	800
<i>Child of a non-single parent</i>	
Aged 0-6 years	320
Aged 7-14 years	320
Aged 15-17 years	320
Aged 18-25, in regular education	480
<i>Child of a single parent</i>	
Aged 0-6 years	440
Aged 7-14 years	440
Aged 15-17 years	440
Aged 18-25, in regular education	480

“Single parent” is a person with children who lives without a spouse. Two cases are distinguished: (a) the single parent’s spouse is known and alive, and (b) the single parent’s spouse is dead or unknown. For a person from case (b), we use the special term “lone parent” (*samohrani roditelj*). This classification is introduced in 09/2015, whereby lone parent obtains the larger amount of the means of subsistence (HRK 800). All children of single parents, whether lone parents or not, receive larger amount since 09/2015 (HRK 440).

Household income includes all types of taxable income (see section 2.8), which are taken in net terms, i.e. after deduction of SICs and PIT. The following social benefits are included: sickness benefits, Unemployment benefit, Maternity leave benefit, Parental leave benefit and Maternity and parental allowance. Paid alimonies are deducted from total income. Since 01/2014 received alimonies are also included in household income, but only the part above a certain threshold, which equals 8.5%, 10% and 11% of ANWPY2, for each supported child aged 0-6, 7-12 and 13-18 years, respectively.

- **Wealth test**

In order to qualify for the benefit, the members of a household must satisfy several conditions regarding the possession and the use of assets, as follows.

Household members are not allowed to use a personal vehicle, whether their own or borrowed. Exceptions are made for households: (a) which have a large number of members (6 or more), (b) in which the vehicle is used for transportation of disabled members, or (c) whose place of living is distanced from the city, if there are no means of public transportation available.

Household members should not own real estate other than the one used for living. More generally, they should not own assets, either non-financial or financial, that could be disposed of without compromising the basic needs of household members.

- **Benefit amount**

The benefit equals the difference between means of subsistence and household income. Before 01/2014, the amount of benefit was not limited. Since 01/2014, the maximum benefit for any household is set to the level of gross minimum wage in Croatia (GMW).

In 01/2014 a “make work pay” measure was introduced. It is intended for the non-employed working-able persons, whose households receive the Subsistence benefit for at least one year. If such a person gets employed, the benefit is not immediately suspended, but gradually decreased. A following benefit calculation procedure applies. Denote with B_i the benefit amount in the i th

month, where $i = 0$ for the month preceding the employment. The monthly benefit amounts in months $i = 0, 1, 2, 3$, are: (a) B_0 , (b) $B_1 = B_0$, (c) $B_2 = 0.75 \cdot B_0$, (d) $B_3 = 0.50 \cdot B_0$, respectively. If employment lasts more than 3 months, the benefit amount is recalculated, taking into account the average household income in the preceding 3 months.

- *EUROMOD notes*

Eligibility

The law requires that working-able Subsistence benefit recipients regularly report to HZZ, participate in education programmes and show preparedness to accept a job. Since the SILC data provide no information on whether these conditions are satisfied, we assume that persons aged between 15 and 65 do satisfy the above mentioned conditions.

Moreover, since we have no information on whether a person is a benefit recipient for more than one year, the “make work pay” element of the policy is not simulated in EUROMOD.

There is no information to establish whether a person is a lone parent. The lone parent is defined as a person with children who does not have a partner and does not receive an alimony.

Wealth test

The wealth test is partially incorporated by checking whether a household has a car or not; exclusions are simulated for large families and households having members with disability, while the exclusion for distanced households is not simulated due to lack of data. Other types of wealth tests are not simulated because no information is available on the possession of secondary houses/apartments, and other assets.

Accounting for non take-up

Benefit non take-up is modelled by assuming that small amounts are not claimed. Based on actual experience, we have set the threshold at 3% of ANWPY.

2.6.2 Unemployment benefit (*bunct_s*)

- *Brief description*

Unemployment benefit is received by unemployed persons, under various conditions, during a limited period that depends on previous working record.

- *Definitions*

The benefit is received by employed persons who become unemployed. Since 01/2014, self-employed persons who become unemployed are also recipients.

- *Eligibility conditions*

Unemployed persons who were employed for at least 9 months during the last 24 months are eligible for benefit receipt. The time spent on sick-leave and parental leave are counted as working time. The termination of the previous job position should not have been voluntary or caused by worker’s violations of working obligations. Self-employed persons can obtain the benefit if the reason for being unemployed is business insolvency or bankruptcy, serious damage of business property, personal illness, etc.

The benefit ceases to be received at the moment of new employment, retirement, fulfilment of the statutory pension age condition, during the period of maternity or parental leave, or in any other condition in which the person loses his/her unemployment status.

The duration of benefit depends on the history of previous work. For a person who has been using the benefit and then employed again, the time spent in work is counted from the beginning of new employment. The relationship between months spent in work and the duration of benefit is shown in the first two columns of the following table.

A special rule relates to people who have worked more than 32 years and whose age is above the statutory pension age minus 5 years. They can receive the benefit until re-employment or retirement.

Table 2.6 Duration of unemployment benefit

Months spent in work	Basic duration (in months) 2017-2020
9 to 24	3
25 to 36	4
37 to 48	5
49 to 60	6
61 to 72	7
73 to 84	8
85 to 96	9
97 to 108	10
109 to 120	11
121 to 180	12
181 to 240	13
241 to 300	14
301 to 384	15

- **Income test**

No income test applies.

- **Benefit amount**

The unemployment benefit base (UBB) is obtained as the average *earnings* during the three-month period preceding unemployment. For employed persons before 02/2017, the *earnings* are equal to gross employment earnings minus pension contributions (section 2.7.2); since 02/2017, the *earnings* are equal to gross employment earnings. For self-employed persons, the *earnings* are equal to contribution base for social insurance contributions (section 2.7.3).

The amount of benefit is proportional to the UBB, but maximum and minimum values are set, which depend on certain percentages of average net wage and net minimum wage (see section 2.4). The amount of benefit decreases with time. The details are presented in the following table:

Table 2.7 Unemployment benefit rates (2017-2020)

	2017-2020
<i>During the first 3 months</i>	
Amount	60% of UBB
Maximum	70% of ANWPY2
Minimum	50% of NMW
<i>In the rest of the period</i>	
Amount	30% of UBB
Maximum	35% of ANWPY2

Minimum 50% of NMW

• **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. unemployment 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).¹

Unemployment duration (*lunmy_s*) is set equal to the maximum of observed unemployment duration (*lunmy*) and observed benefit receipt (*bunctmy*). 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) and have sufficient contribution history, are considered eligible. Benefit duration (*bunmy_s*) is calculated according to the rules described in Table 2.6, using modelled contribution history, while also controlling for the unemployment duration.

Benefit entitlement is calculated based on previous earnings and benefit duration, subject to the lower and upper thresholds. For those currently unemployed and in receipt, previous earnings (*yempv*) were calculated by reversing unemployment insurance benefit rules. Finally, the benefit amount is adjusted with the number of months in receipt.

Table 2.8 Unemployment benefit: basic information

		2017-2020
Eligibility	Contribution period	At least 9 months during the last 24 months
	Other conditions	The termination of the previous job position should not have been voluntary or caused by worker’s violations of working obligations
	Eligibility of self-employed	They can obtain the benefit if the reason for being unemployed is business insolvency or bankruptcy, serious damage of business property, personal illness, etc.
Payment	Contribution base	Average earnings during the three-month period preceding unemployment. For employed persons before 02/2017, the earnings are equal to gross employment earnings minus pension contributions; since 02/2017, the earnings are equal to gross employment earnings
	Basic amount	See Table 2.7
	Additional amount	n/a
	Floor	See Table 2.7
	Ceiling	See Table 2.7
Duration	Standard (in months)	3 to 15 months
	Special cases (in months)	n/a
Subject to	Taxes	No
	SIC	No

¹ Employment changes are modelled in combination with a specific add-on tool and are not part of the baseline simulations.

2.6.3 Grant for a newborn child (*bfaba_s*)

- **Brief description**

The grant is received by a parent of a newborn child.

- **Definitions**

The unit of analysis consists of partners and own children aged 0.

- **Eligibility conditions**

All parents of newborn children are eligible, irrespectively of their working status.

- **Income test**

This is not a means-tested benefit.

- **Benefit amount**

The benefit amount is HRK 2,328 (70% of BB).

2.6.4 Maternity leave benefit (*bfama_s*)

- **Brief description**

The benefit is received by a working mother who is employed or self-employed person, one month before and six months after the birth of a child (children).

- **Definitions**

The unit of analysis is the family, which consists of partners and own dependent children aged 0 or 1.

- **Eligibility conditions**

Mothers who are employed or self-employed persons are eligible for receiving the benefit. The period of receipt is divided into two parts. The *mandatory period*, used by pregnant women / mothers, lasts from the 28th day before the expected delivery date (or from the 45th day, upon medical approval) to the 70th day after birth. The *voluntary period* can also be used by the father. It lasts from the end of the mandatory period to the end of the 6th month after birth.

- **Income test**

This is not a means-tested benefit.

- **Benefit amount**

The benefit base is the beneficiary's average "netted SIC contribution base", obtained during the six-month period preceding work-leave. For employees, the "netted SIC contribution base" is gross wage minus employee's contributions, PIT and Surtax. For self-employed the "netted SIC contribution base" is the base for SIC counterfactually taxed by employees' SIC, PIT and Surtax. The "insurance period condition" assumes that preceding the maternity leave, the beneficiary has been insured, either: (a) at least 12 months continuously, or (b) at least 18 months with interruptions during a 24 month period. Since 04/2020 these requirements were reduced to: (a) 9 months, and (b) 12 months. If the insurance period condition is fulfilled, the benefit amount is equal to 100% of the benefit base during the whole period. Before 07/2017, the minimum benefit

amount was HRK 1,663 (50% of BB). Since 07/2017, the minimum amount is increased to HRK 3,328.20 (70% of BB). If the “insurance period condition” is not met, the benefit is equal to the minimum amount.

- ***EUROMOD notes***

Note that the exact month of birth is not available in the data; only the quarter of the year is known. Hence, it was assumed that children born in the first, second, third and fourth quarter of the year are born in February, May, August and November respectively.

According to administrative data less than 3% of recipients are men. Hence, in EUROMOD the benefit receipt is only granted to mothers for both the mandatory and the voluntary period. Data on average duration of benefit receipt are not available; however, based on common perception, maximum duration is assumed, i.e. 7 months. Mothers of children aged 0 born in February or May receive the benefit for the whole period (i.e. 7 months); mothers of children aged 0 born in August and November receive the benefit for 6 and 3 months respectively. Mothers of children aged 1 born in November and August receive the benefit for 4 and 1 months respectively.

2.6.5 Parental leave benefit (*bfapl_s*)

- ***Brief description***

The benefit is received by working parents taking care of a small child (children).

- ***Definitions***

The unit of analysis consists of partners and own children aged 0 to 3.

- ***Eligibility conditions***

Mothers and fathers who are employed or self-employed persons are eligible for receipt. The benefit can be claimed from the end of the 6th month after the child’s birth until the child reaches the age of 8.

There are two cases: (a) the child is the 1st or the 2nd in a family, (b) the child is the 3rd or subsequent child in family or twins (multiples) are born. In case (a), the leave lasts 6 months if it is only used by the mother, or 8 months if mother and father use 4 months each. In case (b), the leave lasts 30 months and can be also used by mother only, or equally shared by the parents.

- ***Income test***

This is not a means-tested benefit.

- ***Benefit amount***

The benefit base is the beneficiary’s mean net wage received during the six-month period preceding the work-leave.² During the months 1 to 6 (or 1 to 8, if parents share the leave in equal parts), the benefit amount is equal to 100% of the base. Before 07/2017 the maximum was set to HRK 2,661 (80% of BB), while the minimum equalled HRK 1,663 (50% of BB). In case (b), the benefit was equal to HRK 1,663 (50% of BB), in the remaining period (months 7 to 30, or 9 to 30, if parents share the leave in equal parts during the first 8 months). Since 07/2017 the maximum is set to HRK 3,991.20 (120% of BB), while the minimum equals HRK 2,328.20 (70% of BB).

² For employees, the net wage is gross wage minus employee’s contributions and PIT. For self-employed the benefit base is the base for SIC counterfactually taxed by employees’ SIC and PIT.

Likewise, in case (b), the benefit is equal to HRK 2,328.20 (70% of BB), in the remaining period. Since 04/2020 the maximum amount is increased to HRK 5,654.20 (170% of BB).

- **EUROMOD notes**

According to administrative data less than 3% of recipients are men. Hence, in EUROMOD the benefit receipt is only granted to mothers. Data on average duration of benefit receipt are not available. Based on common perception, maximum duration is assumed for case (a). As a consequence, the maximum simulated duration of benefit receipt in that case is 6 months. In case (b) it is assumed that the benefit is used all at once and that it lasts for its maximum duration (i.e. 30 months). The benefit duration (depending on the case and on children’s month of birth) is described in the following table:

Table 2.9 Duration of parental leave benefit (number of months)

<i>for mothers of...</i>	born in February	born in May	born in August	born in November
children aged 0	5	2	0	0
up to 2 children and no twins, youngest child aged 1	1	4	6	6
> 2 children or twins, youngest child aged 1	12	12	11	8
> 2 children or twins, youngest child aged 2	12	12	12	12
> 2 children or twins, youngest child aged 3	1	4	7	10

Notes: The months of birth refer to the youngest child in the benefit unit. Mothers need to have exhausted maternity leave benefit (provided one month before and six months after the birth of a child) before receiving parental leave benefit.

2.6.6 Maternity and parental allowance (*bmanc_s*)

- **Brief description**

The benefit is received by parents of newborn children who are unable to claim for the maternity and the parental leave benefits.

- **Definitions**

The unit of analysis consists of partners and own children aged 0 to 3.

- **Eligibility conditions**

This benefit is designed to provide support to parents taking care of a newborn child (children) who do not qualify as employed or self-employed persons. The following groups are considered as eligible: temporary workers, workers in agriculture, unemployed and inactive persons.

The benefit is received from the child’s birth and can last 12 months at most if the child is the 1st or the 2nd in the family, or 36 months at most if it is the 3rd or subsequent child in the family or if twins (multiples) are born.

- **Income test**

This is not a means-tested benefit.

- **Benefit amount**

Before 07/2017 the benefit amount equalled HRK 1,663 per month (50% of BB). Since 07/2017 the amount is increased to HRK 2,328.20 (70% of BB).

- **EUROMOD notes**

The benefit receipt is only granted to mothers. The benefit duration (depending on the case and on children's month of birth) is described in the following table:

Table 2.10 Duration of Maternity and parental allowance (nr of months)

<i>for mothers of...</i>	born in February	born in May	born in August	born in November
children aged 0	11	8	5	2
up to 2 children and no twins, youngest child aged 1	1	4	7	10
> 2 children or twins, youngest child aged 1	12	12	12	12
> 2 children or twins, youngest child aged 2	12	12	12	12
> 2 children or twins, youngest child aged 3	1	4	7	10

Notes: The months of birth refer to the youngest child in the benefit unit.

2.6.7 Child benefit (*bch_s*)

- **Brief description**

Child benefit is a monthly means-tested benefit paid to families with children below a certain age limit.

- **Definitions**

The unit of analysis consists of households with dependent children. The latter are defined as: (a) persons aged below 15, (b) persons aged between 15 to 18, if involved in secondary education. Group (a) also includes persons aged 15, if involved in primary education – until the end of the school year in which they turned 15. Group (b) also includes persons aged 19, if involved in four-year programs of secondary education – until the end of the school year in which they turned 19. The latter is applicable to persons aged 20, if involved in five-year programs of secondary education. Special categories of children are further defined: (c1) children with ‘impaired health’, (c2) children with ‘severe disability’, and (c3) children of killed, captured or missing HBDR. Children in groups (c1) and (c3) must satisfy age conditions of groups (a) and (b). For children in group (c2), the age limit is 27; since 9/2015, this age limit is removed, under certain conditions. Married person cannot be a dependent child.

- **Eligibility conditions**

Beneficiaries are households with dependent children.

- **Income test**

Monthly household income per member (total household income divided by the number of household members) must be lower than HRK 2,328.20 (70% of BB). This threshold is valid since 07/2018; before that, it equalled HRK 1,663 (50% of BB). Household income is defined the same way as for the Subsistence benefit, except that alimonies are not included. The Subsistence benefit is not part of household income.

- **Benefit amount**

Benefit amounts per child are presented in the following table:

Table 2.11 Child benefit income thresholds and benefit rates (2017-2020), HRK per month

Bracket	Year	Household income per member	Benefit amount per child
1	2017-2020	up to HRK 543.14	299.34
2	2017-2020	HRK 543.15 – 1,119.53	249.45
3	2017-2018	HRK 1,119.54 – 1,663.00	199.56
	2019-2020	HRK 1,119.54 – 2,328.20	

The benefit amounts per child, shown in table above, are increased: (a) by 25%, if both parents are missing or if they are ‘permanently incapable for work and independent living’; (b) by 15%, if one parent is missing or if he/she is ‘permanently incapable for work and independent living’, (c) by 25%, for a child with ‘impaired health’.

Apart from the amounts shown in the table above, the benefit amount designated to a child with ‘severe disability’ is HRK 831.50, irrespectively of household income. Likewise, the amount designated to a child of a killed, captured or missing HBDR is HRK 374.18, irrespectively of household income.

The benefit amount for a household is the sum of amounts designated to each child, according to the rules described above. The benefit amount for a household is augmented by the supplement for the 3rd and the 4th child, which is obtained if the household income per member is below HRK 1,663. The amount of the supplement is: (a) HRK 500, if a household has 3 dependent children, and (b) HRK 1,000, if a household has 4 or more dependent children.

- **EUROMOD notes**

In EUROMOD the state of ‘permanent incapability for work and independent living’ (for parents) and the state of ‘impaired health’ is proxied by disability status, whereas the state of ‘severe disability’ (for children) is not modelled due to lack of relevant information. Child benefit for a child of a killed, captured or missing HBDR is not simulated in EUROMOD due to lack of data. Because data do not indicate the duration of secondary education programs, we assume that all persons in secondary education attend four-year programs.

2.6.8 Compensation for electricity costs (*bhout_s*)

- **Brief description**

This means-tested benefit was established in October 2015. It is intended to income-poor households to assist them in covering of the costs of electricity.

- **Definitions**

The unit of analysis is a household.

- **Eligibility conditions**

Beneficiary is a household that receives Subsistence benefit or a household in which one or more household members receives Personal disability allowance.

- **Income test**

Income test is indirectly implied through Subsistence benefit and Personal disability allowance.

- **Benefit amount**

The amount of the benefit for a household is equal to the monthly cost of electricity, with maximum set at HRK 200.

- **EUROMOD notes**

The amounts of Personal disability allowance are not available in the data. However, persons for whom the average amount of disability benefit (obtained as $12 * bdi / bdimy$) exceeds HRK 1,200, are considered beneficiaries of Personal disability allowance. Furthermore, data do not contain a separate variable for the cost of electricity; instead, the variable “other housing costs” (xhcot) is present, which also includes other types of costs.

2.7 Social insurance contributions

2.7.1 Employer social insurance contributions (*tscer_s*)

- **Liability to contributions**

Employers are required to pay social insurance contributions for each employee. However, there are reliefs for certain groups of employees: (a) employed for the first time, (b) newly employed persons, who were previously long-term unemployed or unemployed with less than a year of work experience; (c) workers aged less than 30. Reliefs (a), (b) and (c) were introduced in 2009, 2012 and 2015, respectively. The duration of reliefs (a) and (b) is 1 and 2 years, respectively. The relief (c) can last up to 5 years.

Regarding the relief (c), the employee and the employer must sign a permanent employment contract (PEC). The employee could have been working for the employer in the past, but not under a PEC; however, the employee could have worked under a PEC for another employer. Work must begin before the employee’s 30th birthday, which means that the relief can be obtained by workers aged 34 years.

- **Income base used to calculate contributions**

The contribution base is gross employment income, which consists of “employee cash or near cash income” (yem) and in-kind fringe benefits (kfb). These two components are joined together for taxation purposes (i_yemkfb).

The floor base is 35% of AGWPY (see Table 2.4). Since 01/2017 the floor base is raised to 38% of AGWPY. There is no ceiling base for these contributions.

Since 01/2018, a new deduction is introduced for employees whose gross employment earnings are equal to GMW or less. In these cases, the contribution base is reduced by 50% in 2019, and by 25% in 2020.

- **Contribution rates**

(a) General health contribution (*tscersi00_s*) The rate is 15% in 2016-2018 and 16.5% in 2019.

(b) Occupational health contribution (*tscersi01_s*). The rate was 0.5% in 2016-2018. In 2019 the contribution was abolished.

(c) Employment contribution (*tscerui_s*). The rate is 1.7% in 2016-2018. In 2019 the contribution was abolished.

2.7.2 Employee social insurance contributions (*tscee_s*)

- **Liability to contributions**

These contributions are paid by private and public sector employees. Persons belonging in contributory scheme A pay Pension contribution A only. Persons in contributory scheme B pay both Pension contribution B1 and B2.

- **Income base used to calculate contributions**

The contribution base is gross employment income (section 2.7.1). The floor base is 35% of AGWPY. Since 01/2017 the floor base equals 38% of AGWPY. For Pension contribution A and Pension contribution B1, both monthly and yearly ceilings are determined: monthly ceiling base is equal to 6 times AGWPY and yearly ceiling base is 72 times AGWPY. For Pension contribution B2 only monthly ceiling base is determined, equal to 6 times AGWPY.

- **Contribution rates**

Persons in contributory scheme A pay Pension contribution A (*tsceepi00_s*). The rate is 20%.

Persons in contributory scheme B pay Pension contribution B1 (*tsceepi01_s*) and Pension contribution B2 (*tsceepi02_s*). The rates are 15% and 5%, respectively.

- **EUROMOD notes**

In order to distinguish people contributing to pillar 1 from people contributing to both pillars 1 and 2 we calculated their age in 2002. If it was less than 40, they had to contribute to both pillars. If it was above 50, they had to contribute to pillar 1 only. People aged between age 40 and 50 could choose voluntarily to which pillar to contribute. However, as we know from the administrative data that 70% of these people had chosen to be in pillar 1, all people of this age group were assumed to contribute only to this pillar.

2.7.3 Self-employed social insurance contributions (*tscse00_s*)

- **Liability to contributions**

Self-employed persons are obliged to pay social insurance contributions. For a definition of self-employed person, see section 1.1. There exist various taxation schemes for self-employed people, which depend on their yearly revenue, type of activity, voluntary choices, etc. The largest group are self-employed persons who run their accounting books on cash basis, and calculate their yearly income as a difference between total receipts and total outlays; they are regular PIT payers (group A). Self-employed persons can opt to pay Corporate income tax instead of PIT, whereby they use accrual basis for accounting (group B). Additionally, self-employed in agriculture and craftsmen can opt for lump-sum PIT (group C), if their yearly revenue is below certain thresholds, while the

former can even be exempted from PIT taxation (group D). Belonging to certain group (A, B, C or D) determines the SIC bases and rates.

We focus on self-employed persons who run accounting books on cash basis and pay PIT (group A). They are divided into four groups: “professionals I”, “professionals II”, “craftsmen” and “farmers I”.

There are two additional groups of farmers. “Farmers II” are self-employed persons in agriculture whose yearly revenue from the business activity is below HRK 80.500 and who do not receive state agricultural subsidies; they are exempted from PIT (group D). “Farmers III” are self-employed persons in agriculture whose yearly revenue from the business activity does not exceed HRK 300.000 (group C); they pay PIT according to lump-sum schedule. In assessing the yearly revenue from the business activity in agriculture, if there is more than one self-employed household member, then the revenues of all members are summed up and compared to the above mentioned thresholds.

There are two types of rental activities: (a) renting of accommodation space to tourists and travellers, and (b) renting of other immovable and movable property. We define “renters I” as: persons from group (a), who rent more than 20 beds or provide physical space for more than 10 accommodation units. “Renters II” are persons from group (b) if their yearly revenue is above HRK 230.000. “Renters I” and “renters II” are treated as self-employed persons and their PIT and SIC status is analogous to the one of “craftsmen”.

“Renters III” are persons from group (a), who rent up to 20 beds to tourists or travellers or if they provide physical space for up to 10 accommodation units (e.g., tents), for up to 30 guests. “Renters IV” are persons from group (b) if their yearly revenue is up to HRK 230.000. “Renters III” (“renters IV”) can voluntarily choose to take the status of “renters I” (“renters II”). “Renters III” and “renters IV” do not pay SICs, but do pay PIT.

- ***Income base used to calculate contributions***

Income bases are lump-sum, i.e. they do not depend on income earned. There are several different lump-sum amounts, which depend on the type of self-employment. The contribution base is obtained as a product of AGWPY and type-specific coefficients, which are shown in the following table:

Table 2.12 Coefficients used in the calculation of self-employed social insurance contributions base

Type of self-employment	Coefficient
professionals I	1.10
professionals II and craftsmen	0.65
farmers I	0.55
farmers II	0.35
farmers III	0.40

Notes: *Professionals I*: health care workers, veterinarians, lawyers, notaries, auditors, engineers, architects, tax advisors, bankruptcy trustees, interpreters, translators, tourist workers;
Professionals II: nurses, dental technicians, physiotherapists, film workers, journalists;
Farmers I: farmers who run accounting books on cash basis, and are PIT payers;
Farmers II: farmers who are exempted from PIT;
Farmers III: farmers who pay lump-sum PIT.

- ***Contribution rates***

The contribution rates for different groups of self-employed people are summarised in the following table:

Table 2.13 Contribution rates (2017-2020)

	Other than Farmers II	Farmers II
General health contribution (<i>tscsesi0000_s</i>)	15%	7.5%
Occupational health contribution (<i>tscsesi0001_s</i>)	0.5%	0.5%
Employment contribution (<i>tscseui_s</i>)	1.7%	1.7%
Pension contribution A (<i>tscsepi0000_s</i>)	20%	10%
Pension contribution B1 (<i>tscsepi0001_s</i>)	15%	5%
Pension contribution B2 (<i>tscsepi0002_s</i>)	5%	5%

Notes: Persons in contributory scheme A pay Pension contribution A; Persons in contributory scheme B pay Pension contribution B1 and Pension contribution B2.

- **EUROMOD notes**

Information on which group a person belongs concerning his/her taxation status is not available in the data. For non-agricultural self-employed persons, we assume that they all run accounting books on cash basis and pay PIT (as group A). They are divided into “professionals I”, “professionals II” and “craftsmen”. Agricultural self-employed persons are divided into “farmers I”, which pay PIT (as group A), and “farmers II”, which are exempted from PIT (as in group D). The division between “farmers I” and “farmers II” is made using an income threshold, which is a proxy for their annual receipts. Renters who declare themselves as self-employed persons (renters I and renters II) are treated as “craftsmen”. Other renters are treated as “renters IV”, because no data is available to distinguish between them and “renters III”.

2.7.4 Contributions on income from contractual work (*tscse01_s*)

- **Liability to contributions**

The contributions are paid by earners of income from contractual work. Some types of contractual work (when earned by pensioners, honoraria for original works of scientists, journalists and artists) are exempt from paying SIC. However, these exemptions were abolished in 01/2017.

- **Income base used to calculate contributions**

The contribution base is equal to “gross receipt” from contractual work, which is the equivalent of “gross wage” (1.4.4). There are no floors or ceilings. In case of honoraria for original works of scientists and journalists (artists), the contribution base equals 70% (45%) of “gross receipt”.

- **Contribution rates**

(a) General health contribution (*tscsesi0100_s*): the rate was 15% until 04/2012. From 05/2012 to 03/2014 the rate was equal to 13%. From 04/2014 and on the rate is 15%. Since 01/2017 the rate is 7.5%.

(b) Pension contributions

Persons in contributory scheme A pay Pension contribution A (*tscsepi0100_s*): the rate is 20% of the contribution base. Since 01/2017 the rate is 10%.

Persons in contributory scheme B pay (1) Pension contribution B1 (*tscsepi0101_s*): the rate is 15% of the contribution base, and (2) Pension contribution B2 (*tscsepi0102_s*): the rate is 5% of the contribution base. Since 01/2017 the rate is 7.5% for Pension contribution B1 and 2.5% for Pension contribution B2.

- ***EUROMOD notes***

Because information on the type of contractual work is not available, it is not possible to model taxation of honoraria for original works of scientists, journalists and artists.

2.7.5 Pensioner health contribution (*tscbesi_s*)

- ***Liability to contributions***

The contribution is paid by pensioners who receive public pensions.

- ***Income base used to calculate contributions***

The contribution base is the “gross pension”.

- ***Contribution rates***

Pensioner health contribution: the rate is 3% of contribution base if the contribution base is above ANWPY. If the contribution base is not greater than ANWPY, the contribution is paid from the CG budget, and this is treated as a credited social insurance contribution (section 2.7.6).

2.7.6 Credited social insurance contributions (*tscct_s*)

- ***Eligibility***

There are several different contributions paid by the CG budget on behalf of various social groups:

- (a) CSIC1 – for persons performing maternity and parental care
- (b) CSIC2a and CSIC2b – for unemployed persons
- (c) CSIC3 – for pensioners with gross pension not greater than ANWPY
- (d) CSIC4 – for persons on sick-leave
- (e) CSIC5 – for recipients of the Covid-19 related Wage compensation

Contributions CSIC1, CSIC2a, CSIC4 and CSIC5 are pension contributions paid to the pillar 2 of the pension system. CSIC2b and CSIC3 are special health contributions, paid to HZZO.

- ***Contribution base***

The contribution bases are equal to:

- (a) for CSIC1, CSIC2a and CSIC2b: 35% of AGWPY in 2016 and 38% of AGWPY since 2017;
- (b) for CSIC3: the “gross pension”;
- (c) for CSIC4: the amount of Sickness benefit.
- (d) for CSIC5: the amount of Wage compensation divided by 0.8; more precisely: HRK 4,062.5 in March and HRK 5,000 in April and May.

- **Contribution rates / amounts**

The rate is 5% of the contribution base for CSIC1, CSIC2a, CSIC2b, CSIC4 and CSIC5. For CSIC3 the rate is 1% of the contribution base.

- **EUROMOD notes**

Contribution CSIC4 is not simulated due to the lack of data on the months spent in sick-leave. Moreover, labour market transitions are switched off in EUROMOD baselines. As a consequence, the simulation of wage compensation schemes does not produce any effect in baseline simulations. Hence, contribution CSIC5 does not produce any effect in the 2020 baseline either.

2.8 Personal income tax (*tin_s*)

2.8.1 Tax unit

The tax unit is an individual who receives income from a taxable income source.

2.8.2 Exemptions

Capital gains were exempted from taxation prior to 2016. Non-pension social benefits are generally excluded from personal income tax. Pensions represent a taxable income source, but exemption is made for children who are beneficiaries of survivor pension, under certain conditions: (a) they were aged less than 15 years at the time of their parent's death; (b) they are aged less than 18 years, or less than 26, if in regular education.

2.8.3 Types of taxpayers, taxable incomes and tax schedules

For introduction on Personal income tax, see section 1.5.2, which explains that taxation differs across types of taxpayers and taxable income sources. More details are provided below.

(a) *Pensions and employment income*: taxed by withholding on a monthly basis, using the monthly-adjusted general tax schedule (see below). In 2016, taxpayers who earn these incomes are not obliged to submit YTF (section 1.5.2). Since 01/2017, all persons who earn these types of income must submit YTF.

(b) *Self-employment income*: different tax treatment applies to various groups of self-employed persons (section 2.7.3).

(b1) *“professionals I”, “professionals II”, “craftsmen” and “farmers I”*: during the year self-employed persons make pre-payments of personal income tax (PIT), amounts of which are determined by Tax Administration, based on the previous year's tax obligation. Self-employed persons are obliged to submit a yearly tax file (YTF).

(b2) *“Farmers II”*: are exempted from PIT.

(b3) *“Farmers III”*: pay PIT according to special lump-sum schedule.

(c) *Income from contractual work*: taxed by withholding as income is earned. In 2016, persons who receive this type of income are not obliged to submit YTF. Since 01/2017, all persons who earn these types of income must submit YTF.

(d) *Capital income*: taxed by withholding as income is earned. In 2016 persons who receive these incomes are not obliged to submit YTF. Since 01/2017, the tax paid by withholding is final in all cases, i.e. capital income does not enter YTF.

(e) *Rental income*: taxpayers who earn income from rental activities have different tax treatment, according to certain conditions (recall section 2.7.3)

(e1) “*Renters I*” and “*renters II*”: taxed as “craftsmen” – see point (b1) above.

(e2) “*Renters III*”: pay PIT according to special lump-sum schedule.

(e3) “*Renters IV*”: their rental income is taxed analogously as capital incomes – see point (d) above.

Table 2.14 Taxation by type of income and taxpayer

Type of income	Taxation throughout the year	Yearly tax file 2016	Yearly tax file 2017-2020
<i>Employment and pension income</i>	withheld, monthly-adjusted general tax schedule	voluntary	obligatory
<i>Self-employment income</i> “professionals I”, “professionals II”, “craftsmen”, “farmers I” “farmers II” “farmers III”	pre-payments	obligatory	obligatory
	exempted lump-sum	n/a not allowed	n/a not allowed
<i>Income from contractual work</i>	withheld, income specific schedule	voluntary	obligatory
<i>Capital income</i>	withheld, income specific schedule	voluntary	not allowed
<i>Rental income</i> “renters I” “renters II” “renters III” “renters IV”	pre-payments pre-payments lump-sum withheld, income specific schedule	obligatory obligatory not allowed voluntary	obligatory obligatory not allowed not allowed

The discussion above has indicated that there are several schedule types, which apply in the following circumstances:

(S1) *Yearly general tax schedule*. It is applied for the following types of income: self-employment income, pensions, employment income and income from contractual work. Other types of income are not included. Taxpayer may use all types of allowances and deductions (sections 2.8.4 and 2.8.5). Tax base equals total income minus allowances minus deductions. The schedule has two rates (section 2.8.7).

(S2) *Monthly-adjusted general tax schedule* is applied to pensions and employment income. Taxpayer may use regular personal tax allowances (sections 2.8.4). Tax base equals total income minus allowances. The schedule is multiple-rate, resembling the yearly general tax schedule, but with bands scaled down to monthly level (section 2.8.7).

(S3) *Income-specific schedules* are one-rate schedules applied to income from contractual work, capital incomes and rental income (“renters IV”). These schedules do not allow for using any personal tax allowances or deductions (section 2.8.7).

(S4) *Lump-sum schedules* do not involve tax rates, but tax amounts are already determined by tax law. They are used in taxation of “farmers III” and “renters III”.

2.8.4 Tax allowances

- ***Eligibility conditions***

Social insurance contributions represent tax allowances. For employed persons, this involves Pension contributions (A, B1, B2); for self-employed persons: all social insurance contributions, i.e., General health contribution, Occupational health contribution and Pension contributions (A, B1, B2); for income from contractual work: Pension contributions (A, B1, B2); for pensioners: Pensioner health contribution.

Each tax unit can claim the *basic personal allowance*. Additionally, a tax unit can claim *personal allowance for supported family members* – children and other family members. The PIT law is not specific on the maximum age of supported children: all children in regular education are included; children who finished their regular education and are waiting for the first job are also included. It is assumed that supported child is not a married person. Other family members include spouses, parents and ‘other children’ (i.e., not in education or with work experience). Before 2019, the definition of family members was less stringent, and included virtually all relatives (e.g., grandparents, grandchildren, parents in law, siblings).

The above mentioned personal allowances are available in the monthly-adjusted general tax schedule for all taxpayers to which this schedule applies. These allowances are also available in the yearly general tax schedule. Personal allowances are not available in income-specific schedules.

- ***Income test***

Total personal income of supported child or other family member (excluding social benefits and children’s family pension) may not exceed: (a) HRK 12,500 in 2017-2018, (b) HRK 15,000 in 2019-2020.

- ***Amounts of allowances***

Basic personal allowance equals HRK 3,800 in 2017-2019, and HRK 4,000 in 2020.

The personal allowance for the i th child is obtained as $CA_i = PAB \cdot [0.5 + 0.05 \cdot i \cdot (i + 3)]$, where PAB is the ‘personal allowance base’ (see section 2.4). For supported other family members the personal allowance is equal to $0.7 \cdot PAB$.

For taxpayer and each dependant with less than 100% disability, the supplement equals $0.4 \cdot PAB$, while it equals $1.0 \cdot PAB$ for persons with 100% disability.

Monthly personal tax allowances are presented in the following table:

Table 2.15 Regular personal tax allowances (2017-2020), HRK per month

	2017-2019	2020
Basic personal allowance	3,800	4,000
Personal allowance for supported family members		

(a) each supported other family member	1,750	1,750
(b1) the first child	1,750	1,750
(b2) the second child	2,500	2,500
(b3) the third child	3,500	3,500
(b4) etc. (see formulas above)		
(c1) supplement for each taxpayer and supported member with disability	1,000	1,000
(c2) supplement for each taxpayer and supported member with 100% disability	3,750	3,750

Splitting of the child allowance

Total personal allowance for c children is equal to $TAC = \sum_i^c CA_i$. This amount can be divided among two parents in whatever proportion. Thus, parents A and B obtain $TAC_A = p \cdot TAC$ and $TAC_B = (1 - p) \cdot TAC$, respectively. In practice, the parent with larger income uses the whole amount of tax allowance, i.e. $p = 1$ or $p = 0$; only a minor share of parents split personal allowance for children.

2.8.5 Tax deductions

- ***Types of deductions***

The following tax deductions are available:

(D1) Donations for cultural, educational, scientific, medical, humanitarian, sports and religious purposes;

(D2) Contributions paid to voluntary pension funds by employers on behalf of their employees or by self-employed persons on behalf of themselves.

Other deductions include: (a) deductions for self-employed who employ persons living in “special areas”, (b) deductions for self-employed, for expenditures on research and development, and outlays for education of young employees, (c) Deductions for HRVI and receivers of HBDR related survivor pension, etc.

- ***Eligibility conditions***

Each tax unit can claim deductions D1 and D2 if the relevant outlays can be documented. Deduction D1 is available in the general schedule only.

- ***Amounts***

The maximum amount of D1 is 2% of the previous tax year’s income. The total yearly amount of D2 is capped on HRK 6,000.

- ***EUROMOD notes***

Due to lack of information, deduction D1 has not been simulated in EUROMOD. Deduction D2 is simulated.

2.8.6 Tax bases

Tax base is obtained differently for various types of income schedules. As a general rule, incomes entering tax base are net of any social insurance contributions (i.e. in post-SIC terms).

(S1) *Yearly general tax schedule in 2017-2020.* Tax base is the sum of selected post-SIC incomes (self-employment income, employment income, pensions and income from contractual work) minus the sum of all personal tax allowances and deductions.

(S2) *Monthly-adjusted general tax schedule.* Tax base is the sum of post-SIC pensions and employment income minus personal tax allowances.

(S3) *Income-specific schedules.* Tax bases are post-SIC income from contractual work, rental income and capital incomes (interest income, dividends, capital gains). Standardised deductions (obtained as a percentage of income) are applied in certain cases.

2.8.7 Tax schedules

- *General tax schedules*

Table 2.16 presents the monthly-adjusted general tax schedule in 2017 and 2018. In 2019 the upper limit is raised from HRK 17,500 to 30,000, as shown in Table 2.17.

Table 2.16 Monthly-adjusted general tax schedule (2017-2018)

Tax band	Income bracket (HRK per month)		Tax rate
	Lower limit	Upper limit	
1	0	17,500	24%
2	17,500	-	36%

Table 2.17 Monthly-adjusted general tax schedule (2019-2020)

Tax band	Income bracket (HRK per month)		Tax rate
	Lower limit	Upper limit	
1	0	30,000	24%
2	30,000	-	36%

Since 01/2017 taxation of pensions on a monthly basis is performed in two steps:(1) *preliminary* tax amount is obtained using the schedule from Table 2.16 and Table 2.17; (2) monthly tax on pensions is obtained as 50% of the preliminary tax amount. The same method is used for taxation of employment income of persons who live on “group 1 special areas” (not simulated). These monthly “tax credits” are also applied in the taxation of yearly income.

The yearly general tax schedule is obtained by multiplying the tax band limits by 12. A provision is made for taxpayers whose total yearly amount of income from contractual work (*YCW*) is not greater than $5 \cdot PAB$. In such case, the limit of the tax band is augmented by $EXT = YCW$. Otherwise, if *YCW* is greater than $5 \cdot PAB$, then $EXT = 0$.

Table 2.18 Yearly general tax schedule (2017-2018)

Tax band	Income bracket (HRK per month)		Tax rate
	Lower limit	Upper limit	
1	0	210,000 + <i>EXT</i>	24%
2	210,000 + <i>EXT</i>	-	36%

Table 2.19 Yearly general tax schedule (2019-2020)

Tax band	Income bracket (HRK per month)		Tax rate
	Lower limit	Upper limit	
1	0	360,000 + <i>EXT</i>	24%
2	360,000 + <i>EXT</i>	-	36%

The *preliminary* yearly tax is obtained using the schedules from Table 2.18 and Table 2.19. To get the final amount, the amounts of “tax credits” must be deducted: (a) for pension income, (b) for employment income of persons who live on “group 1 special areas” (not simulated). In 2020 another tax credit was introduced: (c) for employment income of young workers. Thus, the purpose of these tax credits is to decrease effective tax burden on some income sources and for certain groups of taxpayers. Tax credit (a) is obtained as the preliminary yearly tax multiplied by the share of pension income in total taxable income and by 50%. Tax credit (c) is obtained as the product of: (1) the part of preliminary yearly tax that arrives from taxation of income in the band 1, (2) the share of employment income in total taxable income, and (3) factor $p\%$, where $p = 100$ if a taxpayer is aged up to 25; $p = 50$ if a taxpayer is aged between 26 and 30 years; and $p = 0$ otherwise.

- ***Income-specific schedules***

There are several income-specific schedules, of which we describe the following five:

Table 2.20 Income specific tax schedules

Income source	Tax base	Tax rates			
		2017	2018	2019	2020
Income from contractual work	“gross receipt” <i>minus</i> pension contributions	25%	24%	24%	24%
Rental income (“renters IV”)	70% of gross income	12%	12%	12%	12%
Dividends	gross income above the amount of personal deduction	12%	12%	12%	12%
Interest income	gross income	12%	12%	12%	12%
Capital gains	gross income	12%	12%	12%	12%

- ***Lump-sum schedules***

As explained in section 2.7.3, “farmers III” are self-employed persons in agriculture whose yearly revenue from the business activity does not exceed HRK 300.000. They pay PIT according to lump-sum schedule, shown in Table 2.21. This schedule is applicable since 01/2017; before 01/2017 a similar schedule applied, which consisted of the bottom three brackets in Table 2.21. The schedule also applies to craftsmen with the yearly revenue below HRK 300.000.

Table 2.21 Lump-sum schedule for “farmers III”, HRK per year

Yearly revenue	Counterfactual income, in HRK	Lump-sum tax
less than HRK 85,000	12,750	1,530
HRK 85,000 – 115,000	17,250	2,070
HRK 115,000 – 149,500	22,425	2,691
HRK 149,500 – 230,000	34,500	4,140
HRK 230,000 – 300,000	45,000	5,400

Furthermore, section 2.7.3 defines “renters III” as small entrepreneurs in tourism activities, who also pay PIT according to lump-sum schedule, according to the simple formula: the yearly PIT is the product of the number of units (beds or accommodation spaces) and the per unit amount. The per unit amount is determined by the LSG unit, but it can range from HRK 150 to 1,500.

2.8.8 Final yearly tax

Taxation of income can be divided in two stages: throughout the year and at the end of the year.

In previous discussion (section 2.8.3), we have seen that taxation throughout the year differs by income groups: (A) Pensions and employment income are taxed each month, using the monthly-adjusted general tax schedule; (B) Income from contractual work is usually taxed at the moment when the income transfer is made between the parties (buyer and seller of the service); income-specific schedule is applied; (C) Analogous procedure applies for capital and rental incomes (“renters IV”); (D) self-employed people make tax pre-payments each month; (E) some groups of farmers and renters (“farmers III” and “renters III”) pay monthly lump-sum amounts.

At the end of the year the final yearly tax is assessed. Taxpayers from group D are obliged to submit YTF. On the other hand, those from group E cannot submit YTF for their incomes. The treatment of groups A, B and C differs in two periods – before 01/2017 and since 01/2017. Before 01/2017, persons from groups A, B and C could voluntarily submit YTF. The major reason for submitting YTF is to exploit the full yearly amount of personal allowances and deductions (for more details, see earlier EUROMOD Country Reports for Croatia). Since 01/2017, only persons from groups A and B can voluntarily submit YTF.

- **EUROMOD notes**

- (1) In EUROMOD investment income (yiy) includes dividends, interest income and capital gains. As disentangling the three components is not possible due to lack of available information, the taxation rules that are applicable for dividends were implemented for this income source.
- (2) Special areas are not simulated due to lack of data on the place of living.
- (3) Exemption for children who are beneficiaries of survivor pension (section 2.8.2) is simulated under assumption that they were aged less than 15 years at the time of their parent’s death.
- (4) We simulate the splitting of a child tax allowance. PIT is calculated for three provisional scenarios, in which a partner with larger income uses 100%, 75% and 50% of personal allowance for children, respectively. A couple “chooses” the option in which the lowest total PIT is obtained.
- (5) No information is available on the yearly revenue of “farmers III”. We assume that all of them belong to the first bracket from Table 2.21. Correspondingly, their yearly lump-sum tax is HRK 1,530.
- (6) As noted in section 2.7.3, data available do not make possible to distinguish between renters III and renters IV. Therefore we assume that all earners of rental income (represented by ypt)

belong to the latter group. Accordingly, rental income is taxed using income specific schedule for renters IV (Table 2.20). Recall that renters I and renters II are taxed as self-employed people.

2.9 Other taxes

2.9.1 Surtax (*tmu_s*)

- *Tax unit*

The unit of analysis is the individual.

- *Tax base and tax schedule*

The tax base is the amount of PIT. LSG units set the level of the rate. The maximum rates can be set to: (a) 10% in municipalities, (b) 12% in cities with a population below 30,000, (c) 15% in cities with a population over 30,000, except (d) 30% in Zagreb (where the current rate is 18%).

- *EUROMOD notes*

Due to lack of information on LSG units, the simulated tax rates in EUROMOD were (a) 16% for people living in densely populated areas, (b) 12% for those living in intermediate populated areas and (c) 6% for people living in thinly populated areas. These rates are based on the fact that cities have, on average, larger surtax rates than municipalities. Furthermore, the rates are tuned in such a way so that the ratio between total simulated surtax and PIT aligns with the relevant ratio obtained from administrative data.

2.10 Covid-19 related policies

2.10.1 Wage compensation (*bwkmc_s*)

- *Brief description*

Wage subsidy is received by selected employed and self-employed persons during the Covid-19 related “lockdown” period (March – May 2020).

- *Definitions*

The subsidy is received by employed and self-employed persons.

- *Eligibility conditions*

Employed persons (self-employed persons) receive the subsidy if their employers (they themselves) belong to one of the selected groups, whose business is harmed by the Covid-19 epidemics; for more details, see section 1.6.

- *Income test*

No income test applies.

- *Benefit amount*

The beneficiary obtains the net amount of HRK 3,250 in March, and HRK 4,000 in April and May. The subsidy is exempted from social insurance contributions and PIT. On behalf of each beneficiary, the HZZ pays the relevant amount of Pension contribution B2, which amounts to HRK 203 in March, and HRK 250 in April and May (for simulation of this instrument, see section

2.7.6). In addition to the wage subsidy, employers may pay the top-up salary to their employees, if they have resources.

- **EUROMOD notes**

There is not enough information in the data regarding the eligibility of each worker (employed, self-employed). Therefore, beneficiaries are randomly chosen with probabilities that vary by industry. The probability is obtained as a product of the base probability (Table 2.22) and the calibration factor (0.9 for March, 0.9 for April, and 0.9 for May).

Table 2.22 Base probabilities to obtain the wage compensation, by industry

Industry	Base probability
Agriculture and Fishing	0.7
Mining, Manufacturing and Utilities	0.7
Construction	0.3
Wholesale and retail trade	0.6
Hotels and restaurants	0.8
Transport and communication	0.4
Financial intermediation	0
Real estate and business activities	0.6
Public administration and defence	0
Education	0
Health and social work	0
Other or unknown	0.3

It is assumed that the top-up salary for employees receiving the Wage compensation equals zero, i.e., that the beneficiaries only obtain income from the government during the period of eligibility.

This policy can only produce results if the model is run in combination with the LMA add-on. The individuals that are selected to undergo transitions to the monetary compensation scheme are defined in the TransLMA_hr policy, which is switched on automatically by the add-on. For more information about the modelling of labour market transitions please consult the ‘*Simulating labour market transitions in EUROMOD*’ document.

3. DATA

3.1 General description

The Croatian dataset for EUROMOD 2017-2020 simulations is derived from the EU-SILC standard UDB 2018 (income reference year 2017). It contains the data from wave 2018 of the Croatian SILC survey which is implemented as a 4-year rotating household panel survey.

Commission Regulation 28/2004 defines indicators aimed at measuring unit non-response in EU-SILC final quality reports. At the time of writing the Croatian EU-SILC Quality Report has not yet become available.

Table 3.1 EUROMOD database description

EUROMOD database	HR_2018_a2
Original name	UDB_cHR18*
Provider	Eurostat
Year of collection	2018
Income reference period	2017
Sample size	Indiv: 21,282; HH: 8,383

3.2 Data adjustment

In order to guarantee consistency between demographic variables and income variables which refer to the year before data was collected (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 the sample.

3.3 Imputations and assumptions

3.3.1 Time period

The reference period for the various attributes is:

- Demographic variables (age, marital status, education): at the date of the interview;
- Economic activity status: recorded both at the date of interview and for each month during the income reference year;
- Current employment variables: at the date of the interview;
- Income data: calendar year 2017 (based on 12-months period of receipt);
- Housing, durables possessions, financial, social, and health situation of household: at the date of the interview.

All monetary amounts in the SILC are expressed in annual terms. These are converted into monthly terms (dividing by 12) for the EUROMOD database.

3.3.2 Dropped observations

Persons with year of birth equal to 2018 (39 cases) were excluded from EUROMOD's database, as they were not born in SILC's income reference period. There were no non-respondent households in the original sample.

3.3.3 Gross incomes

In the SILC data missing values are being imputed, if necessary. Most of the imputations are done by the Croatian Bureau of Statistics (*Državni zavod za statistiku*, DZS). In cases there were still some missing values 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.

By default, in EU-SILC all values of income components are in gross terms. The authors have checked the relationship between gross and net incomes from SILC data for all taxable income sources. Certain irregularities have been revealed in the case of self-employment income. For self-employed persons, the DZS staff has used an algorithm that treats all these persons as if they are included into corporate income system (denoted as “group B” in section 2.7.3). However,

actually, this relates only to a small percentage of self-employed persons. Therefore, the estimates of imputed SIC, PIT and gross income for majority of these persons are biased. To cure the problem, the *'Net-to-Gross Income Conversion Model'* was created, consisting of six parts, which perform the following functions: (1) Dividing people who earned self-employment income into groups; (2) Preparation of income variables; (3) Grouping household members into 'native families'; (4) Calculation of PIT; (5) Calculation of SIC and gross income; (6) Obtaining the final variables.

SILC variables py050g and py050n contain gross and net incomes of all self-employed income people, including various groups of self-employed persons and earners of income from contractual work (see sections 2.7.3 and 2.7.4). Self-employed persons are those whose economic status is farmer, employer or self-employed. All other persons with positive self-employment income are *earners of income from contractual work*. Self-employed persons are divided into five mutually exclusive groups: (a) family workers – persons whose self-employed status is “family worker”, (b) farmers – those whose branch of industry is agriculture, (c) “professionals I” – those whose occupation is professionals, (d) “professionals II” – those whose occupation is technicians and associate professionals, (e) all other self-employed persons. Farmers are further divided into “farmers I”, “farmers II” and “farmers III”.

As explained in section 2.7.5, public pensions exceeding ANWPY are subject to 3% Pensioner health contribution. SILC data on pensions do not include this contribution within the gross pension amounts. Therefore, we “inflate” the existing gross pension values by the corresponding factor, in order to obtain the true gross values of pensions.

3.3.4 Disaggregation of harmonized variables

A range of UDB EU-SILC benefit variables have been obtained after aggregation of several country-specific benefits that are recorded by the National SILC survey. The aggregation is done by benefit function, e.g. for old-age, disability, sickness, unemployment, family etc. However, to simulate certain policies in EUROMOD information about the entitlement of single benefits is required. Thus, efforts were made to disaggregate the broader benefit categories by imputing the separate components. The imputations have been done using information in EU-SILC on individual/household characteristics and receipt of the aggregated variables.

However, starting with its 2014 release, SILC data provide more detailed benefit variables. Namely, each of the function variables is divided into four component variables, which represent contributory means-tested, contributory non-means-tested, non-contributory means-tested and non-contributory non-means-tested benefits. This separation simplifies the identification procedure. Nevertheless, some imputations are necessary, as shown in the rest of this section.

The following table contains the main variables that are derived for the Croatian part of EUROMOD dataset by imputations.

Table 3.2 EUROMOD database description

Variable name in EUROMOD	Variable description	Component of the aggregated variable in EU-SILC
Bfamh	maternity and parental benefits	HY052G
Bch	Child benefit	HY053G
Bfaba	Lump-sum grant for newborn children	HY054G
Bfaot	other family benefits	HY054G
bsa00	Subsistence benefit	HY060G

Bsaot	other social assistance benefits	HY060G
Bunct	Unemployment benefit	PY092G
Bunot	other unemployment benefits	PY092G
ysv00	severance pay - for surplus workers	PY094G
Poa	old-age pensions	PY102G
Boa	old-age benefits	PY103G
ysv02	severance pay - upon old-age retirement	PY104G
Psu	survivor pensions	PY112G
Bsu	survivor benefits	PY113G
Pdi	disability pensions	PY132G
Bdi	disability benefits	PY133G
ysv01	severance pay - upon retirement due to disability	PY134G

In the following description we use the abbreviations such as hy052g, which represents the actual values of SILC variable HY052G, multiplied by the HRK/EUR exchange rate and divided by 12.

As explained in section 1.3.4, there are several unemployment benefits, among which the Unemployment benefit has the major role. The variable PY090G bunches them together, also including severance pay. However, 2018 SILC for Croatia disaggregates PY090G into PY092G and PY094G, where the latter represents severance pay for surplus workers, and the former contains all other unemployment benefits. Severance pay for surplus workers is simply obtained as $ysv00 = py094g$. In the next step, a simple model is created, which disentangles $py092g$ into Unemployment benefit and other unemployment benefits. The model first simulates the duration of unemployment benefit for each person with $py092g > 0$ (see section 2.6.2). The amount of $py092g$ is then allocated between: (a) Unemployment benefit (bunct): if the duration of unemployment benefit is at least 1 month and if $py092g > 0.5 * NMW$ (i.e. the minimum Unemployment benefit that can be obtained for 1 month), and (b) other unemployment benefits (bunot), if otherwise.

The variable PY130G, which contains disability benefits, is also disaggregated in the 2018 SILC. The variables PY132G, PY133G and PY134G contain disability pensions, disability benefits and severance pay upon retirement due to disability, respectively, from which the variables pdi, bdi and ysv01 are created.

In a similar way, from the variables PY102G, PY103G and PY104G we have obtained old-age pensions (poa), old-age benefits (boa) and severance pay upon old-age retirement (ysv02). Total severance pay is the sum of individual components ($ysv = ysv00 + ysv01 + ysv02$).

Survivor pensions (psu) and survivor benefits (bsu) are obtained from PY112G and PY113G, respectively.

There are several social assistance benefits (section 1.3.7), among which the primary role is taken by the Subsistence benefit. The variable HY060G contains these benefits and because they are all non-contributory and means-tested, no disaggregation is possible within SILC. Since only Subsistence benefit can be modelled in EUROMOD, imputation of Subsistence benefit is performed. The amount of Subsistence benefit (bsa00) is calculated for all households, for which purpose a model is created, that uses the parameters described in section 2.6.1. For households in which $bsa00 > hy060g$, the value of Subsistence benefit was reduced to $bsa00 = hy060g$. For households in which $bsa00 < hy060g$, the value of Subsistence benefit was kept the same, and furthermore, the value of Other social assistance benefits is obtained as $bsaot = hy060g - bsa00$.

The variable HY050G contains family benefits and is separated into four components: HY052G, HY053G and HY054G. From HY052G, maternity and parental benefits (bfamh) are obtained. HY053G contains Child benefit (bch). HY054G is disaggregated in the Grant for a newborn child (bfaba) and other family benefits (bfaot). The latter may include grants for newborn children paid by LSG and RSG units, and the Temporary alimony.

3.4 Uprating

To account for any time inconsistencies between the input dataset and the policy year, uprating factors are used. Each monetary variable (i.e. each income component) is uprated so as to account for changes in the non-simulated variables that have taken place between the year of the data and the year of the simulated tax-benefit system. Uprating factors are generally based on changes in the average value of an income component between the year of the data and the policy year.

As a rule, uprating factors are provided both for simulated and non-simulated income components present in the input dataset. Note however that in the case of simulated variables, the actual simulated amounts are used in the baseline rather than the uprated original variables in the dataset. Uprating factors for simulated variables are provided so as to facilitate the use of the model in cases when the user wishes to turn off the simulation of a particular variable. The list of uprating factors as well as the sources used to derive them can be found in Table 3.3.

Table 3.3 Raw indices for deriving EUROMOD uprating factors

Index	Constant name	Values of the raw indices				Income components uprated by the index	Sources & Notes
		2017	2018	2019	2020		
Harmonized CPI	\$HICP	100.67	102.23	103.29	104.84	afc, xhcmomi, ypp, xpp, xmp, xhcot	S2
GDP	\$f_gdp	107.66	112.42	118.15	106.33	ysv	S1, S3; N1
employment income	\$f_yem					kivho, kfbcc, kfb, bhl, yem_a, yivwg, ypt,	S4; N2
		105.85	111.01	115.19	118.27	yot, yem, yempv	
self-employment income	\$f_yse	105.85	111.01	115.19	118.27	ysenr00, ysere01, ysere00, ysenr01, yse	see \$f_yem
property income	\$f_ypr	107.66	112.42	118.15	106.33	xhcrt, ypr	see \$f_gdp
investment income	\$f_yiy	107.66	112.42	118.15	106.33	iyi	see \$f_gdp
old-age pensions	\$f_poa	62.64	64.74	67.16	68.45	poa	S5; N3
disability pensions	\$f_pdi	62.64	64.74	67.16	68.45	pdi	see \$f_poa
survivor pensions	\$f_psu	62.64	64.74	67.16	68.45	psu	see \$f_poa
unemployment benefit	\$f_bunct	105.85	111.01	115.19	118.27	bunct	see \$f_yem
other unemployment benefits	\$f_bunot	105.85	111.01	115.19	118.27	bunot	see \$f_yem
family benefits	\$f_bfa	3326.00	3326.00	3326.00	3326.00	bfa	S6; N4
housing benefits	\$f_bho	500.00	500.00	500.00	500.00	bho	S7
education allowances	\$f_bed	107.66	112.42	118.15	106.33	bed	\$f_gdp
subsistence benefit	\$f_bsa00	500.00	500.00	500.00	500.00	bsa00	see \$f_bho
other social assistance benefits	\$f_bsaot	500.00	500.00	500.00	500.00	bsaot	see \$f_bho
one	\$f_one					tis, tscer, tscee, tad, tpr, ydses_o, yds,	
		1.00	1.00	1.00	1.00	tscse, tin, tmu	
disability benefits	\$f_bdi	500.00	500.00	500.00	500.00	bdi, bcrdi	see \$f_bho
child benefit	\$f_bch	3326.00	3326.00	3326.00	3326.00	bch	see \$f_bfa
grant for a newborn child	\$f_bfaba	3326.00	3326.00	3326.00	3326.00	bfaba	see \$f_bfa
maternity and parental benefits	\$f_bfamh	105.85	111.01	115.19	118.27	bfamh	see \$f_yem
survivor benefits	\$f_bsu	3326.00	3326.00	3326.00	3326.00	bsu	see \$f_bfa
old-age benefits	\$f_boa	62.64	64.74	67.16	68.45	boa	see \$f_poa
old-age pensions	\$f_poa_av	101.95	104.42	108.32	110.40	poa	S8
disability pensions	\$f_pdi_av	105.96	113.17	117.40	119.66	pdi	see \$f_poa_av
survivor pensions	\$f_psu_av	101.35	104.66	108.57	110.66	psu	see \$f_poa_av

Sources:

	Institution	Publication	Table / page	Internet link
S1	European Commission	Country Report Croatia 2020	Table 1.1: Key economic, financial and social indicators – Croatia	https://ec.europa.eu/info/sites/info/files/2020-european_semester_country-report-croatia_en.pdf
S2	European Commission	Economic and Financial Affairs - AMECO	Table 2.4: Consumer price index	http://ec.europa.eu/economy_finance/ameco/user/serie/SelectSerie.cfm
S3	Croatian National Bank	Statistics (web)	Main macroeconomic indicators	http://www.hnb.hr/en/statistics/main-macroeconomic-indicators
S4	Croatian Bureau of Statistics	Statistics in line: Employment and Wages	Table 9.3.3.	https://www.dzs.hr/eng/publication/StatisticsInLine.htm
S5	HZMO	Statističke informacije Hrvatskog zavoda za mirovinsko osiguranje	Table “Aktualna vrijednost mirovine, najniža mirovina i postotak usklađivanja”	http://www.mirovinsko.hr/default.aspx?id=723
S6	Ministry of Finance, Republic of Croatia	NN 117/19	Zakon o izvršavanju Državnog proračuna Republike Hrvatske za 2020. godinu	http://narodne-novine.nn.hr/clanci/sluzbeni/2016_12_119_2606.html
S7	Government of the Republic of Croatia	NN 114/14	Odluka o osnovici za izračun iznosa drugih prava iz sustava socijalne skrbi	http://narodne-novine.nn.hr/clanci/sluzbeni/2014_09_114_2173.html
S8	HZMO	Statističke informacije Hrvatskog zavoda za mirovinsko osiguranje (various issues)	Various tables	http://www.mirovinsko.hr/default.aspx?id=723

Notes:

NN denotes the official gazette “Narodne novine”. Legal acts published in NN are available online in Croatian, at <http://narodne-novine.nn.hr/default.aspx>.

N1: For 2020: imputation made using forecasts of GDP and HCPI (from S1).

N2: For 2020: imputation made using forecasts of “Nominal compensation per employee” (from S1).

N3: Based on the “actual value of pension”, yearly averages.

N4: Based on the monthly amount of “budgetary base”.

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 yearly amounts are shown in Annex 2. 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.

The sources of external data are described in section 5.2.

4.1.1 Components of disposable income

In this section, the main differences between the definition of disposable income in EUROMOD and EU-SILC are presented.

Table 4.1 Components of disposable income

	EUROMOD 2017	EU-SILC 2018
	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 insurance contributions	-	-
Repayments/receipts for tax adjustment	0	+

4.1.2 Validation of incomes inputted into the simulation

Table 7.1 in Annex presents the differences between the number of employed and unemployed in the input dataset and external statistics.

There is a huge discrepancy concerning the number of unemployed, where the EUROMOD / SILC figure for 2017 is 91% higher than the figure based on external statistics, which is based on the Labour Force Survey (LFS). This can be explained by the differences in methodology, where the LFS definition of unemployed person is much stricter than the one of SILC. Evidently, large numbers of LFS-inactive have reported themselves as unemployed in SILC. For example, the calculations have shown that among the 288 thousand persons who have been “unemployed” during all 12 months in 2017 (according to variable *lummy*), only 116 thousand have been “actively looking for a job in previous 4 weeks”, at the time of the interview (according to variable *lowas*). Oppositely, the number of employed in SILC is lower by about one tenth in comparison to LFS data.

Table 7.2 in Annex 2 shows the differences between the number of recipients of various types of market income in the input dataset and external statistics. Table 7.3 presents the differences in aggregate annual amounts. The input dataset is based on 2018 SILC, while external statistics come from Tax Administration.

SILC figures for the number of employed and total employment income in 2017 are, respectively, 9% and 4% lower than the administrative ones. Note that employment income consists of “employee cash or near cash income” (*yem*) and in-kind fringe benefits (*kfb*) (see section 2.7.1). As employment income is one of the main income sources, we have performed a comparison of wage distributions from the two data sources. Employment incomes are divided into eight brackets, which were formed as percentages of AGW (see Table 2.4). Let us concentrate on 2017. Administrative data show significantly larger number of employees (by 37%) in the interval of 25% to 50% of AGW. This is probably due to common feature of Croatian labour market, where many employers report their employees at the minimum wage, which lies in this interval, and pay the other part of salary in cash. SILC data show a slightly larger number of employees in the next several brackets, between 50% to 200% of AGW. In all subsequent brackets, SILC shows smaller numbers of employees than administrative data, and the coverage ratio falls with gross income. The ratio between the number of employees in SILC and administrative data is only 54% for the income interval beyond 300% of AGW.

Table 7.4 in Annex 2 presents the differences between the number of recipients of various types of non-simulated benefits and numbers of payers of non-simulated taxes in the input dataset and external statistics. Table 7.5 shows the differences in aggregate yearly amounts of non-simulated taxes and benefits.

Pensions. Administrative data come from two sources – HZMO and Tax Administration. In comparison to the latter source, SILC data underestimate the total number of pensioners by about 4% in 2017. Tax Administration data on pensions are used to impute the structure by income brackets (rows *pen*, *pen01*, etc.). There is a relatively good correspondence between SILC and administrative data for the lower brackets. However, for higher brackets there is a huge discrepancy between SILC and administrative data. Namely, in 2017, there are 45 thousand persons with pension beyond 100% of AGW in SILC, compared to only 11 thousand in administrative data. This divergence was not seen for earlier datasets.

Housing benefits. The number of beneficiaries and total amount of housing benefits in SILC stand at about nine tenths of the administrative figures.

Survivor benefits. As shown in section 1.3.2, these benefits cover a range of survivor benefits, and their total amount according to administrative sources is somewhat below HRK 370 million. However, SILC data capture only 5% of that amount. The reason may be that survey respondents report these benefits under survivor pensions (which are, however, also underreported, as we have seen above).

Sickness benefits. Another large discrepancy among non-simulated benefits is in the case of sickness benefits, where SILC data represent only about one third of total amount according to administrative sources. One reason for this might be that surveyed persons treat sickness benefits as employment income.

Disability benefits. The final underestimated category are disability benefits; the ratio between SILC/EUROMOD and official figures is about one half. As in the case of *survivor benefits*, a part of disability benefits may be reported as disability pensions.

4.1.3 Validation of outputted (simulated) incomes

Table 7.6 in Annex 2 presents the numbers of recipients of various types of simulated benefits and numbers of payers of simulated taxes, in EUROMOD and external statistics. Table 7.7 shows the same for aggregate yearly amounts.

Child benefit. In 2017 and 2018 EUROMOD results fit relatively well with the administrative data (HZMO). There is a 16% under-appreciation for the number of households which receive the benefit and similar underestimation for the total amount. However, in 2019 the model greatly overestimates the number of beneficiaries, by 33%, and somewhat less the total amount, by 13%. As explained in section 2.6.7, the top means-test bracket was significantly increased in 07/2018, which led to large increase of beneficiaries in 2019, according to EUROMOD. But, administrative figures show that the number of beneficiaries remained roughly the same, probably due to high non take-up rate in the new circumstances (Urban & Pezer, 2019).

Grant for a newborn child. EUROMOD underestimates the total number of beneficiaries and the amount of Grant for a newborn child by about 18%. The official statistics (DZS) says that about 37 thousand children have been born and received the benefit in 2017. However, input data contain only 30 thousand children of age 0.

Maternity leave benefit. EUROMOD captures about four fifths of the administrative amount of this benefit and its beneficiaries. One of the reasons is the same as for the Grant for a newborn child, as explained above. The second reason can be found in underestimation of higher employment incomes in input data, and the benefit is related to wage (see section 2.6.3).

Parental leave benefit. The number of beneficiaries is significantly underestimated in EUROMOD, by more than a half in 2017, as the SILC sample underrepresents not only children aged 0, but also children of age 1 and 2. The underestimation of the total amount is also 50% in 2017, and about 40% in 2018 and 2019.

Maternity and parental allowance. EUROMOD underestimates the number of beneficiaries by about one third in 2017. The explanation is the same as in the case of previous two benefits. In contrast, the total amount of benefit is underestimated by only 18%. The model assumes that each beneficiary receives the benefit in the maximum duration, but in reality this may not be the case.

Subsistence benefit. EUROMOD obtains 14% (in 2017) to 40% (in 2019) more beneficiaries than according to administrative figures. On the other hand, the discrepancy in the aggregate amount is significantly smaller, ranging from -4% in 2017 to 20% in 2019.

Unemployment benefit. SILC data seriously underestimate the number of recipients and the total amount of Unemployment benefit. According to SILC, 34 thousand people received unemployment benefits in 2017, whereas the administrative figure for Unemployment benefit is 94 thousand. EUROMOD uses SILC data to determine which persons are receiving Unemployment benefit, and also uses the amount of benefit recorded in SILC to calculate the benefit base (yempv). Given all these conditions, it is not unexpected that the ratio between EUROMOD and administrative total amount of Unemployment benefit is only 41% in 2017.

We have seen in the previous section that input data capture about 96% of total employment income, as registered in official sources. Consequently, similar discrepancy can be noticed for employer SIC, employee SIC, and personal income tax.

Employer and employee social insurance contributions. Regarding the total amount, the ratio between EUROMOD and administrative figures is about 94% to 100% in different years.

Self-employed social insurance contributions. EUROMOD overstates the total amount of SIC for self-employed persons in comparison to administrative figures by about 60% in 2017.

Personal income tax and Surtax. The ratio between EUROMOD output and administrative data for Personal income tax is relatively low: 78%. The progressive structure of PIT causes that the major share of total tax is paid by higher income individuals; but they and their income are underrepresented in SILC, as indicated in section 4.1.2 (Table 7.2 and Table 7.3). Furthermore, in the last several years the PIT system sees an increased reliance on capital income, which tends to be seriously underreported. In order to reveal where the ‘leakages’ exactly come from Table 7.8 disentangles PIT revenue according to income sources. According to Tax administration 2017 data, more than HRK 1 billion was collected on account of capital income, but EUROMOD registers only HRK 25 million, or 2%. In absolute terms, the largest discrepancy comes from PIT on employment income, which is further disaggregated by gross income. People whose gross wage is above 300% of AGW paid HRK 2.1 billion of PIT in 2017, but only one half of this amount is present in EUROMOD.

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 are calculated as the sum of all income sources of all household members net of income tax and social insurance contributions. The weights in the OECD equivalence are: first adult=1; additional people aged 14+ = 0.5; additional people aged under 14 = 0.3.

4.2.1 Income inequality

Table 7.9 in Annex 2 presents income distribution indicators in EUROMOD and external statistics. External statistics on income distribution come from EUROSTAT, and are based on SILC for income years 2017 and 2018. Recall that EUROMOD uses the SILC data for income year 2016 (section 3.1).

Median and mean income. In 2017, the mean and median income in EUROMOD are about 1 or 2 percentage points higher than in external statistics. However, in 2018 EUROMOD estimates of the median and mean income are about 3 percentage points lower than external statistics. The latter discrepancy can be partly explained by the fact that EUROMOD does not account for the growth in employment, which equalled 1.8% between 2017 and 2018, according to the external statistics.

Gini coefficient. The 2017 Gini coefficients in EUROMOD and external statistics are 29.0 and 29.7, respectively. This difference of 0.7 percentage points can be explained by the fact that EUROMOD simulates certain income items (see below).

Income distribution by decile groups. The comparison by decile group income shares tells a similar story as the Gini coefficients. In 2017, lower income decile shares are overstated in EUROMOD, especially for the first decile group (by 14.6%), while the tenth income decile is understated (by 2.2%), in comparison to external data. These difference occur because

EUROMOD provides Subsistence benefit and Child benefit to all eligible households. Contrarily, in reality some households do not take up these benefits or do not report them in SILC survey.

4.2.2 Poverty rates

Table 7.10 in Annex 2 presents poverty rates in EUROMOD and external statistics, which come from EUROSTAT and are based on SILC surveys.

Poverty rates by age groups. In 2017, EUROMOD shows slightly higher poverty rates for all age subgroups than the external source, except for the group ‘0-15 years’. In 2018 the over appreciation of EUROMOD in comparison to external source becomes even stronger for all groups except for the group ‘50-64 years’.

Poverty rates for different poverty lines. In 2017, EUROMOD shows almost identical poverty rates as external source for all selected poverty lines, for both men and women. The exception is ‘40% median HDI’, where EUROMOD poverty rates in 2017 are by about 5% lower than in external data. However, these relationships are much different in 2018; the ratio between EUROMOD and external source significantly rises for different subgroups, except for ‘70% median HDI’ poverty line.

4.3 Validation of minimum wage

Table 7.11 in Annex 2 shows the results without and with implementation of the minimum wage. The implementation of the minimum wage brings almost insignificant changes in the amounts of various income, benefit and tax items.

4.4 Summary of “health warnings”

The analysis in section 4.1 has shown that SILC data, which serve as input for EUROMOD, have certain deficiencies in terms of representativeness and coverage. Higher income earners are underrepresented in the SILC sample, which may particularly influence the analysis of PIT and employee/employer SICs. Some of the benefits, which cannot be simulated in EUROMOD, like sickness and disability benefits, are also underrepresented, which may give biased results on poverty rates.

Personal income tax. Due to the lack of data on the place of living, we could not simulate tax reliefs for people who live on special areas. For the same reason, we had to come up with an “educated guess” in order to specify the rates for Surtax.

Self-employed social insurance contributions. Due to the lack of data on the type of self-employed persons, it was necessary to introduce certain assumptions, based on occupation and industry. As explained in section 3.3.3, due to the problems with gross incomes of self-employed persons, we had to develop our own net-to-gross computation procedure.

Unemployment benefit. As noted above, EUROMOD uses SILC data to determine which persons are receiving Unemployment benefit, and also uses the amount of benefit recorded in SILC to calculate the benefit base (yempv). However, the number of beneficiaries and the aggregate amount is significantly underestimated in SILC as compared to administrative data, and this problem extends to EUROMOD.

Wage compensation. The simulation of bwkmc_s is triggered by the simulation of labour market transitions defined in policy TransLMA_hr. This policy becomes operational if the model is run in conjunction with the LMA add-on. The nature of these simulations is still experimental and

only partially validated. Users are encouraged to refer to the ‘*Simulating labour market transitions in EUROMOD*’ document prior to their use.

Labour market transitions. Labour market transitions (TransLMA_hr policy) are switched OFF in EUROMOD baselines. As a consequence, the simulation of monetary compensation schemes does not produce any effect in baseline simulations. Since all policies not linked to labour market transitions are fully functional, it is possible for disposable income in 2020 to be higher than disposable income in previous years.

5. REFERENCES

5.1 Sources for tax-benefit descriptions/rules

Note: NN denotes the official gazette “Narodne novine”. Legal acts published in NN are available online in Croatian, at <http://narodne-novine.nn.hr/default.aspx>.

- **Taxation**

Institutions:

Porezna uprava (Tax Administration), <http://www.porezna-uprava.hr/>

Legal framework:

Zakon o porezu na dohodak (Act on personal income tax) (NN 115/16, 106/18)

Zakon o doprinosima (Act on social insurance contributions) (NN 84/08, 152/08, 94/09, 18/11, 22/12, 144/12, 148/13, 41/14, 143/14, 115/16, 106/18)

- **Pensions**

Institutions:

Ministarstvo rada i mirovinskog osiguranja (Ministry of Labour and Pension System), <https://mrms.gov.hr>

Hrvatski zavod za mirovinsko osiguranje (Croatian Pension Insurance Institute), <http://www.mirovinsko.hr/>

Legal framework:

Zakon o mirovinskom osiguranju (Act on public pension insurance) (NN 157/13, 151/14, 33/15, 93/15, 120/16, 18/18, 62/18, 115/18)

- **Labour**

Institutions:

Ministarstvo rada i mirovinskog osiguranja (Ministry of Labour and Pension System), <https://mrms.gov.hr>

Zavod za zapošljavanje (Croatian Employment Service), <http://www.hzz.hr/>

Legal framework:

Zakon o tržištu rada (Act on the labour market) (NN 118/18)

- **Health**

Institutions:

Ministarstvo zdravstva (Ministry of Health), <https://zdravlje.gov.hr>

Hrvatski zavod za zdravstveno osiguranje (Croatian Institute for Health Insurance), <http://www.hzzo.hr/>

Legal framework:

Zakon o zdravstvenoj zaštiti (Act on health protection) (NN 100/18)

Zakon o obveznom zdravstvenom osiguranju (Act on mandatory health insurance) (NN 80/13, 137/13)

- **Family**

Institutions:

Ministarstvo za demografiju, obitelj, mlade i socijalnu politiku (Ministry of Demography, Family, Youth and Social Policy), <https://mdomsp.gov.hr>

Legal framework:

Zakon o doplatku za djecu (Act on child benefit) (NN 94/01, 138/06, 107/07, 37/08, 61/11, 112/12, 82/15, 58/18)

Zakon o roditeljskim i roditeljskim potporama (Act on maternity and parental benefits) (NN 85/08, 110/08, 34/11, 54/13, 152/14, 59/17)

- **Social assistance**

Institutions:

Ministarstvo za demografiju, obitelj, mlade i socijalnu politiku (Ministry of Demography, Family, Youth and Social Policy), <https://mdomsp.gov.hr>

Legal framework:

Zakon o socijalnoj skrbi (Act on social assistance) (NN 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19)

- **Disability**

Institutions:

Ministarstvo za demografiju, obitelj, mlade i socijalnu politiku (Ministry of Demography, Family, Youth and Social Policy), <https://mdomsp.gov.hr>

Legal framework:

Zakon o zdravstvenoj zaštiti (Act on health protection) (see above)

Zakon o profesionalnoj rehabilitaciji i zapošljavanju osoba s invaliditetom (Act on rehabilitation and employment of persons with disability) (NN 157/13, 152/14, 39/18)

- **War veterans**

Institutions:

Ministarstvo hrvatskih branitelja (Ministry of Croatian Veterans), <https://branitelji.gov.hr>

Legal framework:

Zakon o hrvatskim braniteljima iz Domovinskog rata i članovima njihovih obitelji (Act on the Croatian Defenders of the Homeland War and their family members) (NN 121/17)

Zakon o zaštiti vojnih i civilnih invalida rata (Act on the protection of military and civil invalids of war) (NN 33/92, 77/92, 58/93, 2/94, 76/94, 108/95, 82/01, 103/03, 148/13)

5.2 Sources for external data

In their publications or by request, DZS provides statistical data in all areas. These data represent the main source for external validation, and are supplemented by administrative data provided by various government institutions, as follows:

- **Taxation**

Data are obtained from Tax Administration by request.

- **Pensions**

Croatian Pension Insurance Institute: “Statističke informacije Hrvatskog zavoda za mirovinsko osiguranje” (statistical information); available at:
<http://www.mirovinsko.hr/default.aspx?id=723>

- **Labour**

Croatian Employment Service: “Godišnjak” (yearly report); available at:
<http://www.hzz.hr/usluge-poslodavci-posloprimci/publikacije-hzz/>

- **Health**

Croatian Institute for Health Insurance: “Godišnje izvješće” (yearly report); available at:
<https://www.hzzo.hr/o-zavodu/izvjesca/>

- **Family, Social assistance and Disability**

Ministry of Demography, Family, Youth and Social Policy: statistical reports; available at:
<https://mdomsp.gov.hr/pristup-informacijama/statisticka-izvjesca-1765/1765>

5.3 Other

Urban, I., & Bezeredi, S. (2016). *EUROMOD Country Report: Croatia, 2011-2015*, Institute for Social and Economic Research.

Urban, I., & Bezeredi, S. (2017). *EUROMOD Country Report: Croatia, 2013-2016*, Institute for Social and Economic Research.

Urban, I., Bezeredi, S., & Pezer, M. (2017). *EUROMOD Country Report: Croatia, 2014-2017*, Institute for Social and Economic Research.

Urban, I., Bezeredi, S., & Pezer, M. (2018). *EUROMOD Country Report: Croatia, 2015-2018*, Institute for Social and Economic Research.

Urban, I., Bezeredi, S., & Pezer, M. (2019). *EUROMOD Country Report: Croatia, 2016-2019*, Institute for Social and Economic Research.

Urban, I., & Pezer, M. (2019). About child benefit. *Newsletter* 118. Institute of Public Finance (Zagreb).

6. ANNEX 1: POLICY EFFECTS IN 2019-2020

In this section we analyse the direct tax-benefit policy effect on household disposable income in Croatia between 2019 and 2020. We try to understand how changes (or non-changes) to tax-benefit policies have affected household incomes in the two periods, abstracting from changes in the population characteristics (e.g., increased unemployment) and the distribution of market/original gross incomes (e.g., reduction in wages). It should be noted that tax-benefit policies in a given year are taken as of 30th of June.

Table A1 and Figure A1 show the policy effect measured in real terms by income component and income decile group. The effect is estimated as the difference between simulated household net income under the 2020 tax-benefit policies (deflating the tax-benefit monetary parameters by Eurostat's Harmonized Index of Consumer Prices, HICP) and net incomes simulated under 2019 policies, as a percentage of mean equivalised household disposable income (MEHDI) in 2019. Households are ranked based on their equivalised household disposable income. The total policy effect on household incomes is decomposed into the different components: public pensions, means-tested benefits, non-means-tested benefits, employee and pensioner social insurance contributions (SIC), self-employed SIC and direct taxes. We isolate the policy effect from changes in market/original income, i.e. changes to market/original incomes are not considered as part of the policy effect and so, they have no effect on disposable income.

The HICP is projected to rise only by 0.4% between 2019 and 2020. Public pensions are adjusted using the "current value of pension", which increases by about 2.7%, i.e., much more than the HICP. Therefore, pension income increases in real terms for all groups: between 0.4% of MEHDI in the top decile group and 1% of MEHDI for the two bottom decile groups.

In contrast, means-tested benefits (Child benefit and Subsistence benefit) are not inflation-adjusted, and their real value falls due to the increase in the price level. The largest fall is felt by the first decile group, which is most dependent on means-tested benefits; its MEHDI decreases by 0.2%.

The only major policy changes between 2019 and 2020 occurred in the PIT system: (a) basic personal allowance is increased from HRK 3,800 to HRK 4,000; (b) tax relief is introduced for employment income of workers younger than 30. Except for the bottom two decile groups, all income groups experience the rise of MEHDI. However, this rise of income has a regressive pattern, i.e., the relative gains for the top decile groups are much larger than the gains of poorer decile groups. The total effect due to PIT changes is 0.8% of MEHDI.

The maximum amount of Parental leave benefit is increased by 42% in 2020. This change is mostly registered in the decile group 7, whose real MEHDI increases by 0.1% (see column "Non means-tested benefits").

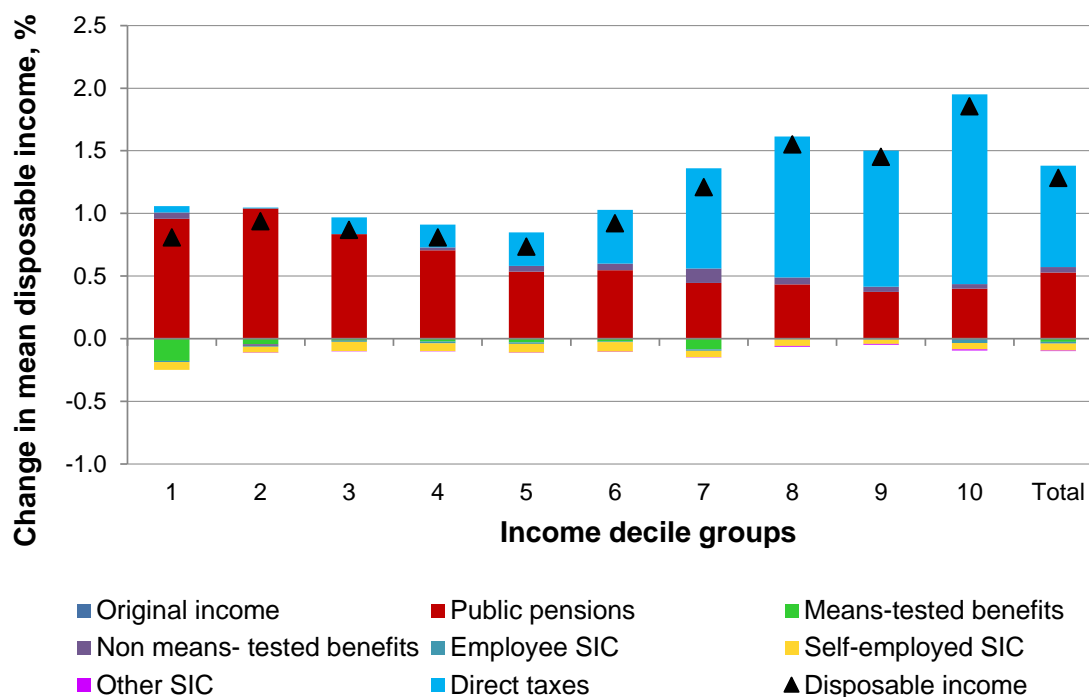
Overall, disposable income increases by 1.3% on average in real terms (1.4% in nominal terms). While the favourable indexation of pensions brings larger relative advantage to the lower income groups, the opposite is true for the PIT changes. Thus, for example, the top decile group's MEHDI increases by 1.9%.

Table A1: Policy effects in 2019-2020, using the CPI-indexation, %

Dec.	Original income	Public pensions	Means-tested benefits	Non means-tested benefits	Employee SIC	Self-employed SIC	Other SIC	Direct taxes	Disposable income
1	0.00	0.96	-0.18	0.05	-0.01	-0.06	0.00	0.05	0.81
2	0.00	1.04	-0.04	-0.01	-0.01	-0.04	0.00	0.01	0.94
3	0.00	0.84	-0.02	0.00	-0.01	-0.07	0.00	0.13	0.87
4	0.00	0.71	-0.02	0.02	-0.01	-0.06	0.00	0.18	0.81
5	0.00	0.53	-0.03	0.05	-0.01	-0.07	0.00	0.27	0.74
6	0.00	0.55	-0.02	0.05	0.00	-0.08	0.00	0.43	0.92
7	0.00	0.45	-0.09	0.11	-0.01	-0.05	0.00	0.80	1.21
8	0.00	0.43	0.00	0.05	0.00	-0.05	-0.01	1.13	1.55
9	0.00	0.37	0.00	0.04	-0.01	-0.04	-0.01	1.09	1.45
10	0.00	0.40	0.00	0.04	-0.03	-0.05	-0.01	1.52	1.86
Total	0.00	0.53	-0.02	0.05	-0.01	-0.06	0.00	0.81	1.28

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 2019, using the modified OECD equivalence scale. Each policy system has been applied to the same input data, deflating monetary parameters of 2020 policies by Eurostat's Harmonized Index of Consumer Prices (HICP). 'Other SIC' includes pensioners' health contribution.

Figure A1: Policy effects in 2019-2020, using the CPI-indexation, %



7. ANNEX 2: VALIDATION TABLES

Note: In Table 7.2 through Table 7.10 no external information is available for 2020. In Table 7.9 and Table 7.10 no external information is available for 2019 and 2020.

Table 7.1: Number of employed and unemployed

	EUROMOD	External				Ratio			
	2017	2017	2018	2019	2020	2017	2018	2019	2020
Number of employed	1,489,659	1,625,000	1,655,000	1,680,000	1,649,000	0.92	0.90	0.89	0.90
Number of unemployed	392,094	205,000	152,000	119,000	123,000	1.91	2.58	3.29	3.19

Table 7.2: Market income in EUROMOD, number of recipients

		EUROMOD	External			Ratio		
		2017	2017	2018	2019	2017	2018	2019
yem	employment income	1,447,131	1,592,830	1,642,971	1,689,372	0.91	0.88	0.86
yem01	empl. income: below 25% of AGW	112,268	269,021	282,138	290,949	0.42	0.40	0.39
yem02	empl. income: 25% to 50% of AGW	230,241	316,086	316,742	312,400	0.73	0.73	0.74
yem03	empl. income: 50% to 75% of AGW	405,812	359,487	380,022	400,118	1.13	1.07	1.01
yem04	empl. income: 75% to 100% of AGW	250,685	231,045	247,963	259,694	1.09	1.01	0.97
yem05	empl. income: 100% to 150% of AGW	319,760	275,406	277,514	285,635	1.16	1.15	1.12
yem06	empl. income: 150% to 200% of AGW	74,257	72,322	72,523	72,665	1.03	1.02	1.02
yem07	empl. income: 200% to 300% of AGW	40,691	44,738	43,550	44,453	0.91	0.93	0.92
yem08	empl. income: above 300% of AGW	13,417	24,725	22,520	23,457	0.54	0.60	0.57
ysenr00	tax exempted income of self-employed persons	14,665	N/A	N/A	N/A	N/A	N/A	N/A
ysenr01	non-reported income from contractual work	143,794	N/A	N/A	N/A	N/A	N/A	N/A
ysere00	reported income of self-employed persons	120,707	132,046	135,225	141,009	0.91	0.89	0.86
ysere01	reported from contractual work	84,236	321,781	255,437	319,928	0.26	0.33	0.26
ysv	severance payments	10,014	29,054	29,307	28,554	0.34	0.34	0.35
yot	income of children under 16	175,356	N/A	N/A	N/A	N/A	N/A	N/A
ypp	private pensions	1,768	N/A	N/A	N/A	N/A	N/A	N/A
ypr	property income	133,040	N/A	N/A	N/A	N/A	N/A	N/A
yiy	investment income	151,874	N/A	N/A	N/A	N/A	N/A	N/A
ypt	private transfers received	89,134	N/A	N/A	N/A	N/A	N/A	N/A
xmp	maintenance payments	65,416	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.3: Market income in EUROMOD, annual amounts (in HRK million)

		EUROMOD				External			Ratio		
		2017	2018	2019	2020	2017	2018	2019	2017	2018	2019
yem	employment income	120,647	126,529	131,293	134,804	125,174	135,018	145,992	0.96	0.94	0.90
yem01	empl. income: below 25% of AGW	1,655	1,735	1,801	1,849	3,403	4,002	4,546	0.49	0.43	0.40
yem02	empl. income: 25% to 50% of AGW	9,037	9,478	9,835	10,098	12,917	13,785	14,616	0.70	0.69	0.67
yem03	empl. income: 50% to 75% of AGW	24,135	25,311	26,264	26,967	22,376	25,282	27,989	1.08	1.00	0.94
yem04	empl. income: 75% to 100% of AGW	21,059	22,085	22,917	23,529	20,096	22,734	25,009	1.05	0.97	0.92
yem05	empl. income: 100% to 150% of AGW	37,048	38,854	40,317	41,395	32,577	34,603	37,266	1.14	1.12	1.08
yem06	empl. income: 150% to 200% of AGW	12,477	13,085	13,578	13,885	12,186	12,850	13,512	1.02	1.02	1.00
yem07	empl. income: 200% to 300% of AGW	9,456	9,917	10,290	10,621	10,374	10,740	11,415	0.91	0.92	0.90
yem08	empl. income: above 300% of AGW	5,781	6,063	6,291	6,459	11,246	11,022	11,639	0.51	0.55	0.54
ysenr00	tax exempted income of self-employed persons	529	555	575	591	N/A	N/A	N/A	N/A	N/A	N/A
ysenr01	non-reported income from contractual work	1,467	1,538	1,596	1,639	N/A	N/A	N/A	N/A	N/A	N/A
ysere00	reported income of self-employed persons	11,372	11,926	12,375	12,706	6,837	7,232	7,515	1.66	1.65	1.65
ysere01	reported from contractual work	2,379	2,495	2,589	2,658	3,710	3,923	4,169	0.64	0.64	0.62
ysv	severance payments	247	258	272	244	840	1,031	916	0.29	0.25	0.30
yot	income of children under 16	200	210	218	224	N/A	N/A	N/A	N/A	N/A	N/A
ypp	private pensions	11	11	11	12	N/A	N/A	N/A	N/A	N/A	N/A
ypr	property income	2,115	2,209	2,321	2,089	N/A	N/A	N/A	N/A	N/A	N/A
yiy	investment income	208	218	229	206	8,593	8,689	9,533	0.02	0.03	0.02
ypt	private transfers received	1,098	1,152	1,195	1,227	N/A	N/A	N/A	N/A	N/A	N/A
xmp	maintenance payments	703	714	719	732	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.4: Tax benefit instruments included but not simulated in EUROMOD, number of recipients/payers

		EUROMOD	External			Ratio		
		2017	2017	2018	2019	2017	2018	2019
Benefits								
poa	Old-age pensions [▲]	770,383	791,854	800,913	818,101	0.97	0.96	0.94
pdi	Disability pensions [▲]	125,962	198,526	192,933	192,933	0.63	0.65	0.65
psu	Survivor pensions [▲]	181,887	241,759	239,455	239,455	0.75	0.76	0.76
pen	Total public pensions [▲]	1,078,233	1,125,582	1,156,051	1,157,370	0.96	0.93	0.93
pen01	publ. pensions: below 25% of AGW	404,788	480,155	508,037	497,538	0.84	0.80	0.81
pen02	publ. pensions: 25% to 50% of AGW	497,805	490,008	499,299	508,119	1.02	1.00	0.98
pen03	publ. pensions: 50% to 75% of AGW	71,629	116,259	106,796	110,880	0.62	0.67	0.65
pen04	publ. pensions: 75% to 100% of AGW	59,024	28,631	29,010	28,505	2.06	2.03	2.07
pen05	publ. pensions: 100% to 150% of AGW	37,501	9,928	12,322	11,691	3.78	3.04	3.21
pen06	publ. pensions: 150% to 200% of AGW	5,971	543	524	571	10.99	11.40	10.46
pen07	publ. pensions: 200% to 300% of AGW	1,405	46	55	58	30.58	25.42	24.12
pen08	publ. pensions: above 300% of AGW	110	12	10	9	8.92	11.34	12.35
bho	Housing benefits	33,303	36,875	N/A	N/A	0.90	N/A	N/A
bsaot	Other social assistance benefits	34,309	N/A	N/A	N/A	N/A	N/A	N/A
bunot	Other unemployment benefits	1,826	N/A	N/A	N/A	N/A	N/A	N/A
boa	Old-age benefits	90,595	N/A	N/A	N/A	N/A	N/A	N/A
bsu	Survivor benefits	2,291	N/A	N/A	N/A	N/A	N/A	N/A
bed	Education allowances	32,906	N/A	N/A	N/A	N/A	N/A	N/A
bhl	Sickness benefits	30,533	N/A	N/A	N/A	N/A	N/A	N/A
bdi	Disability benefits	102,695	N/A	N/A	N/A	N/A	N/A	N/A
Taxes and Social Insurance contributions								
tpr	Property tax	347,984	N/A	N/A	N/A	N/A	N/A	N/A

Source: [▲] HZMO; [▲] Tax Administration.

Table 7.5: Tax benefit instruments included but not simulated in EUROMOD, annual amounts (in HRK million)

		EUROMOD				External			Ratio		
		2017	2018	2019	2020	2017	2018	2019	2017	2018	2019
Benefits											
poa	Old-age pensions	29,566	30,557	31,700	32,540	23,517	24,362	25,843	1.26	1.25	1.23
pdi	Disability pensions	5,180	5,354	5,554	5,701	6,849	7,109	7,035	0.76	0.75	0.79
psu	Survivor pensions	4,720	4,879	5,061	5,195	6,290	6,433	6,566	0.75	0.76	0.77
pen	Total public pensions	39,467	40,790	42,315	43,436	33,947	35,928	37,646	1.16	1.14	1.12
pen01	publ. pensions: below 25% of AGW	7,322	7,682	7,972	8,183	7,110	7,694	7,911	1.03	1.00	1.01
pen02	publ. pensions: 25% to 50% of AGW	17,201	17,667	18,324	18,810	16,633	17,754	18,705	1.03	1.00	0.98
pen03	publ. pensions: 50% to 75% of AGW	4,435	4,909	5,244	5,383	6,655	6,455	6,918	0.67	0.76	0.76
pen04	publ. pensions: 75% to 100% of AGW	4,880	4,909	4,941	5,072	2,367	2,524	2,599	2.06	1.95	1.90
pen05	publ. pensions: 100% to 150% of AGW	4,306	4,436	4,602	4,724	1,086	1,403	1,402	3.97	3.16	3.28
pen06	publ. pensions: 150% to 200% of AGW	983	838	869	892	82	83	95	11.96	10.07	9.16
pen07	publ. pensions: 200% to 300% of AGW	298	308	319	328	9	11	13	31.38	27.58	24.81
pen08	publ. pensions: above 300% of AGW	40	42	43	45	5	3	4	8.58	12.52	10.68
bho	Housing benefits	106	106	106	106	115	104	104	0.92	1.02	1.02
bsaot	Other social assistance benefits	193	193	193	193	118	178	178	1.64	1.08	1.08
bunot	Other unemployment benefits	5	5	5	5	524	345	345	0.01	0.01	0.01
boa	Old-age benefits	70	72	75	77	243	238	230	0.29	0.30	0.33
bsu	Survivor benefits	18	18	18	18	369	358	353	0.05	0.05	0.05
bed	Education allowances	305	319	335	300	N/A	N/A	N/A	N/A	N/A	N/A
bhl	Sickness benefits	525	551	571	587	1,509	1,605	1,685	0.35	0.34	0.34
bdi	Disability benefits	750	750	750	750	1,547	1,756	1,756	0.48	0.43	0.43
Taxes & Social Insurance contributions											
tpr	Property tax	200	200	200	200	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.6: Tax benefit instruments simulated in EUROMOD, number of recipients/payers

		EUROMOD				SILC	Ratio	External			Ratio		
		2017	2018	2019	2020	2017	2017	2017	2018	2019	2017	2018	2019
Benefits													
bsa	Subsistence benefit	51,405	50,199	48,977	47,913	28,538	1.80	45,099	38,765	35,103	1.14	1.29	1.40
bunct	Unemployment benefit	33,411	34,175	34,175	34,175	34,175	0.98	94,052	89,758	93,147	0.36	0.38	0.37
bch	Child benefit	129,024	118,254	191,116	183,285	137,444	0.94	153,258	140,765	143,246	0.84	0.84	1.33
bfaba	Grant for a newborn child	30,032	30,032	30,032	30,032	20,878	1.44	36,588	37,128	36,286	0.82	0.81	0.83
bfama	Maternity leave benefit	26,249	26,249	26,249	26,249	N/A	N/A	33,367	34,394	34,203	0.79	0.76	0.77
bfapl	Parental leave benefit	21,341	21,341	21,341	21,341	N/A	N/A	43,851	46,107	48,179	0.49	0.46	0.44
bmanc	Maternity and parental allowance	26,619	26,619	26,619	26,619	N/A	N/A	41,615	39,045	36,396	0.64	0.68	0.73
bfamh	All parental benefits (bfama, bfapl & bmanc)	74,209	74,209	74,209	74,209	55,932	1.33	118,833	119,546	118,778	0.62	0.62	0.62
bhout	Compensation for electricity costs	71,393	70,392	69,169	68,105	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Taxes and Social Insurance contributions													
tin	Personal income tax	1,054,848	1,138,109	1,208,507	1,107,417	979,104	1.08	N/A	N/A	N/A	N/A	N/A	N/A
tmu	Surtax	1,054,848	1,138,109	1,208,507	1,106,483	979,104	1.08	N/A	N/A	N/A	N/A	N/A	N/A
tscsicer	Employers: all SIC	1,394,414	1,372,951	1,353,762	1,348,393	N/A	N/A	1,592,830	1,642,971	1,689,372	0.88	0.84	0.80
tscepp	Employees: pension SIC	1,443,571	1,443,571	1,443,571	1,443,571	N/A	N/A	1,592,830	1,642,971	1,689,372	0.91	0.88	0.85
tscsicse00	Self-employed: all SIC	117,457	117,457	117,457	117,457	N/A	N/A	132,046	135,225	141,009	0.89	0.87	0.83
tscsicse01	"Other income" earners: all SIC	84,236	84,236	84,236	84,236	N/A	N/A	321,781	255,437	319,928	0.26	0.33	0.26
tscbesi	Pensioners: health SIC	109,481	109,481	109,481	109,481	N/A	N/A	47,215	51,819	58,608	2.32	2.11	1.87
tscsict	Credited SIC	1,178,760	1,178,760	1,178,760	1,178,760	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.7: Tax benefit instruments simulated in EUROMOD, annual amounts (in HRK million)

		EUROMOD				SILC	Ratio	External			Ratio		
		2017	2018	2019	2020	2017	2017	2017	2018	2019	2017	2018	2019
Benefits													
bsa	Subsistence benefit	534	513	506	501	259	2.06	559	485	421	0.96	1.06	1.20
bunct	Unemployment benefit	350	378	401	424	292	1.20	846	826	869	0.41	0.46	0.46
bch	Child benefit	1,047	959	1,368	1,320	1,065	0.98	1,209	1,159	1,208	0.87	0.83	1.13
bfaba	Grant for a newborn child	72	72	72	72	50	1.45	85	86	84	0.84	0.83	0.85
bfama	Maternity leave benefit	694	725	748	770	N/A	N/A	844	914	961	0.82	0.79	0.78
bfapl	Parental leave benefit	268	385	387	456	N/A	N/A	512	646	681	0.52	0.60	0.57
bmanc	Maternity and parental allowance	339	474	474	474	N/A	N/A	412	472	448	0.82	1.00	1.06
bfamh	All parental benefits (bfama, bfapl & bmanc)	1,301	1,584	1,610	1,701	1,289	1.01	1,768	2,033	2,089	0.74	0.78	0.77
bhout	Compensation for electricity costs	169	166	163	161	N/A	N/A	123	114	114	1.37	1.46	1.44
Taxes and Social Insurance contributions													
tin	Personal income tax	8,326	9,311	10,000	9,296	9,114	0.91	10,611	11,890	13,021	0.78	0.78	0.77
tmu	Surtax	1,039	1,158	1,241	1,164	1,137	0.91	1,241	1,391	1,524	0.84	0.83	0.81
tscsicer	Employers: all SIC	20,011	20,623	20,288	20,794	N/A	N/A	20,350	21,235	21,475	0.98	0.97	0.94
tscepp	Employees: pension SIC	23,982	25,147	26,100	26,800	N/A	N/A	23,945	25,556	27,332	1.00	0.98	0.95
tscsicse00	Self-employed: all SIC	2,579	2,677	2,766	2,863	N/A	N/A	1,619	1,672	1,746	1.59	1.60	1.58
tscsicse01	"Other income" earners: all SIC	416	437	453	465	N/A	N/A	473	510	549	0.88	0.86	0.83
tscbesi	Pensioners: health SIC	327	338	351	360	N/A	N/A	422	454	475	0.78	0.74	0.74
tscsicct	Credited SIC	811	844	891	926	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.8: Personal income tax in detail - Annual amounts (in HRK million)

		EUROMOD				External			Ratio		
		2017	2018	2019	2020	2017	2018	2019	2017	2018	2019
tin	Personal income tax	8,326	9,311	10,000	9,296	10,611	11,890	13,021	0.78	0.78	0.77
tinlabpen	PIT - earnings and pensions	8,047	9,020	9,694	9,021	9,133	10,315	11,281	0.88	0.87	0.86
tinpro	PIT - property income	254	265	279	250	440	501	559	0.58	0.53	0.50
tincap	PIT - capital income	25	26	27	25	1,038	1,073	1,181	0.02	0.02	0.02
tinemp	PIT - employment income	6,617	7,462	8,050	8,093	8,257	9,268	10,174	0.80	0.81	0.79
tinemp01	PIT - empl. income: below 25% of AGW	25	30	35	33	39	64	92	0.65	0.47	0.38
tinemp02	PIT - empl. income: 25% to 50% of AGW	68	82	95	91	119	171	217	0.57	0.48	0.44
tinemp03	PIT - empl. income: 50% to 75% of AGW	229	326	412	374	382	561	720	0.60	0.58	0.57
tinemp04	PIT - empl. income: 75% to 100% of AGW	703	845	960	943	951	1,186	1,385	0.74	0.71	0.69
tinemp05	PIT - empl. income: 100% to 150% of AGW	2,303	2,598	2,836	2,863	2,220	2,509	2,822	1.04	1.04	1.00
tinemp06	PIT - empl. income: 150% to 200% of AGW	1,173	1,295	1,385	1,394	1,157	1,277	1,388	1.01	1.01	1.00
tinemp07	PIT - empl. income: 200% to 300% of AGW	1,061	1,151	1,219	1,256	1,244	1,336	1,439	0.85	0.86	0.85
tinemp08	PIT - empl. income: above 300% of AGW	1,056	1,135	1,109	1,139	2,144	2,164	2,111	0.49	0.52	0.53

Table 7.9: Distribution of equivalised disposable income

	EUROMOD				External			Ratio		
	2017	2018	2019	2020	2017	2018	2019	2017	2018	2019
D1	3.0	3.0	2.9	2.9	2.6	2.8	0.0	1.146	1.057	0.000
D2	4.8	4.8	4.8	4.7	4.8	4.9	0.0	0.993	0.974	0.000
D3	6.2	6.2	6.2	6.2	6.1	6.2	0.0	1.018	1.001	0.000
D4	7.4	7.4	7.5	7.4	7.5	7.3	0.0	0.984	1.010	0.000
D5	8.5	8.5	8.6	8.6	8.5	8.6	0.0	1.001	0.993	0.000
D6	9.7	9.7	9.8	9.7	9.7	9.5	0.0	1.003	1.026	0.000
D7	11.1	11.1	11.1	11.1	11.1	10.9	0.0	1.002	1.020	0.000
D8	12.7	12.7	12.6	12.7	12.7	12.6	0.0	1.002	1.009	0.000
D9	15.1	15.0	15.0	15.0	15.1	14.8	0.0	0.999	1.013	0.000
D10	21.5	21.6	21.5	21.7	22.0	22.2	0.0	0.978	0.971	0.000
Median	50616.0	52804.7	55170.1	56480.1	49700.0	54200.0	0.0	1.018	0.974	0.000
Mean	55675.0	57957.7	60149.1	61991.5	55018.0	60008.0	0.0	1.012	0.966	0.000
Gini	29.0	28.9	28.8	29.1	29.7	29.3	0.0	0.975	0.988	0.000
S80/S20	4.7	4.7	4.7	4.8	5.0	4.8	0.0	0.945	0.992	0.000

Table 7.10: Poverty rates by gender and age

	EUROMOD				External			Ratio		
	2017	2018	2019	2020	2017	2018	2019	2017	2018	2019
40% median HDI										
Total	7.8	7.8	8.0	8.1	8.3	7.2		0.94	1.09	N/A
Males	7.7	7.7	7.8	7.9	8.1	7.1		0.95	1.08	N/A
Females	7.8	8.0	8.2	8.3	8.4	7.4		0.93	1.08	N/A
50% median HDI										
Total	13.6	13.6	14.0	14.1	13.6	12.3		1.00	1.11	N/A
Males	12.7	12.7	13.0	13.1	12.8	11.5		0.99	1.10	N/A
Females	14.4	14.5	14.9	15.0	14.4	13.0		1.00	1.12	N/A
60% median HDI										
Total	19.5	19.5	19.8	19.8	19.3	18.3		1.01	1.06	N/A
Males	18.4	18.4	18.6	18.6	18.1	17.2		1.01	1.07	N/A
Females	20.5	20.5	20.8	20.8	20.4	19.4		1.01	1.06	N/A
70% median HDI										
Total	26.1	26.2	26.5	26.1	26.2	25.7		1.00	1.02	N/A
Males	24.8	24.8	25.1	24.7	24.9	24.5		0.99	1.01	N/A
Females	27.4	27.5	27.8	27.4	27.5	26.8		1.00	1.03	N/A
60% median HDI										
0-15 years	18.7	18.2	18.7	18.8	19.2	16.8		0.97	1.09	N/A
16-24 years	18.3	18.2	18.7	18.6	18.0	15.9		1.02	1.14	N/A
25-49 years	14.1	14.0	14.2	14.2	14.0	12.4		1.01	1.13	N/A
50-64 years	20.2	20.3	20.4	20.4	19.9	18.8		1.01	1.08	N/A
65+ years	29.0	29.4	29.7	29.7	28.1	30.3		1.03	0.97	N/A

Table 7.11: Minimum wage validation

	Baseline				Min Wage Incl.				Ratio			
	2017	2018	2019	2020	2017	2018	2019	2020	2017	2018	2019	2020
equivalised disposable income	146,071	151,976	157,649	162,470	146,139	152,051	157,793	162,760	1.000	1.000	0.999	0.998
employment income	120,647	126,529	131,293	134,804	120,734	126,621	131,477	135,164	0.999	0.999	0.999	0.997
Personal income tax	8,326	9,311	10,000	9,296	8,327	9,313	10,005	9,298	1.000	1.000	1.000	1.000
Surtax	1,039	1,158	1,241	1,164	1,039	1,158	1,241	1,165	1.000	1.000	1.000	1.000
Employers: all SIC	20,011	20,623	20,288	20,794	20,020	20,647	20,322	20,860	1.000	0.999	0.998	0.997
Employees: pension SIC	23,982	25,147	26,100	26,800	23,994	25,160	26,130	26,865	1.000	0.999	0.999	0.998
Subsistence benefit	534	513	506	501	533	512	504	498	1.002	1.003	1.004	1.006
Child benefit	1,047	959	1,368	1,320	1,042	957	1,363	1,318	1.005	1.002	1.003	1.002
Median	50,616	52,805	55,170	56,480	50,627	52,820	55,250	56,671	1.000	1.000	0.999	0.997
Poverty rate (60% median HDI)	19.5	19.5	19.8	19.8	19.5	19.5	19.8	19.7	1.001	1.000	0.999	1.000
Gini coefficient	29.0	28.9	28.8	29.1	28.9	28.9	28.8	29.0	1.001	1.001	1.001	1.003