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EUROMOD is the tax-benefit microsimulation model for the European Union (EU). It 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 27 Member States and is yearly updated to cover the most recent changes in countries' policy systems. It uses input databases which are also updated on a yearly basis, coming mainly from the European Union Statistics on Income and Living Conditions (EU-SILC) and Household Budget Surveys (HBS). The model yearly update is supported by the following Directorate-Generals of the European Commission: DG EMPL, DG ECFIN, DG TAXUD, DG REFORM, DG JRC, DG ESTAT.

Originally maintained, developed and managed by the Institute for Social and Economic Research (ISER), since 2021 these responsibilities are taken over by the Joint Research Centre (JRC) of the European Commission, in collaboration with Eurostat and 27 national teams from the EU countries.

The EUROMOD governance structure consists of a Steering Committee, allowing partner DGs to monitor the process of the EUROMOD update, and a Scientific Advisory Board to monitor and guide the scientific development of the model.

This report documents the work done in the most recent annual update for Belgium. This work was carried out by the EUROMOD core development team, based at the JRC in Seville, in collaboration with the national team.

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EUROMOD documentation: https://euromod-web.jrc.ec.europa.eu/resources/documentation

Glossary of EUROMOD terms: https://euromod-web.jrc.ec.europa.eu/resources/glossary

Policy parameters used in EUROMOD: https://euromod-web.jrc.ec.europa.eu/resources/parameters

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1. BASIC INFORMATION

1.1 Basic information about the tax-benefit system

- The German fiscal budget consists of three major single funds, i.e. the budget of the state ("Bund"), the budget of the federal states ("Länder"), and the budget of the municipalities ("Gemeinden"). Furthermore, the budget of the social insurance system ("Sozialversicherungen") is sometimes subsumed under the fiscal budget. Generally, tax and benefit rules may vary over the three main levels, "Bund", "Länder", and "Gemeinden". Some taxes are levied by one of the three administrative units alone, whereas other taxes are shared. However, with respect to tax and benefits rules as well as rates, the German tax and benefit system is a largely unified, national system. Some exceptions can be found among the taxes. The tax rate for church taxes varies slightly over the Länder. At the local business tax as well as the property tax, tax rates vary significantly between municipalities, as the local jurisdictions levy their own multipliers. Tax rates for the real property acquisition tax vary over the "Länder".
- In Germany, the fiscal year for taxes and benefits runs from 1st of January to 31st of December. This is usually the time when changes in taxes or benefits apply. However, the current pension value is adjusted annually on 1st of July.
- The statutory pension age in Germany is 65. This age will be gradually increased, for entry into old-age pension between 2012 and 2031, by one month each year, so that the statutory pension age will be 67 in 2031. Generally, entering retirement earlier is only possible with reduction in the pension level. This used to be different for women ("Altersrente für Frauen"). However, since 2004, there is no possibility anymore for women – as it is for men -- to enter retirement earlier, without accepting reductions.
- Students in Germany may leave secondary schools with a general-school-leaving degree at the age of 15 if they attended school for at least nine years. The Youth Employment Protection Act ("Jugendarbeitsschutzgesetz") settles the minimum employment age at 15. However, till the age of 18, school leavers are obliged to pursue secondary education in the framework of vocational training or apprenticeships, at least on a part-time basis.
- The definition of dependent children that is most commonly applied in the German tax and transfer system relates to the definition in the context of child benefits ("Kindergeld"). According to these regulations, dependent children are biological, adopted, or foster children, aged 18 or younger, who live in the same household with their parents. They can at maximum be aged 25 in case they are still in tertiary education and do not work more than 20 hours a week on average. This definition may differ depending on the benefit to be considered.
- Lone parents are generally eligible to a household allowance for single parents in German income taxation law. Single parents, in this context, are not married and not widows or widowers. They must be living in a household together with a dependent child which is eligible for child benefits and actually belongs to the household. No other adult person – not even a grandparent -- is allowed to live in this household. Parents may though prove that they do not pool money with other adults in the household. Only the parent who is eligible to the allowance can receive it and it cannot be assigned to the other parent in any case.
- Generally, individuals are taxed individually in German income tax law. Married couples are assessed to joint taxation in the form of full income splitting. Taxable income of the

spouses is added up, the tax schedule is applied to half of this sum, and the resulting tax burden is doubled.

- A specific element of German income tax law is the progression clause (Progressionsvorbehalt). This is relevant for some types of income which are not directly subject to income tax, e.g. unemployment benefits I. Even though these incomes are not included in the tax base, they are included in the base used to determine the tax bracket of the progressive income tax schedule. This way these incomes may increase the income tax rate used for the other income sources which are subject to the income tax.
- There is a final withholding tax on capital income ("Abgeltungssteuer"), which consists of a flat tax rate of 25% on capital income exceeding an allowance that is collected at source.
- Taxes on income from dependent employment are collected at source, i.e. directly at the employer every month, in the form of pay-roll tax ("Lohnsteuer"). Monthly income is also the reference figure for most of the means-tested benefits in German benefit law. Usually, a past time frame of three to 24 months is applied, where monthly income may not exceed specific thresholds, on average. As pay-roll taxes are not final in Germany, it is common to file income tax returns to apply tax allowances and deductions. This is usually done altogether at the end of the year (or even in the following year).
- There is no statutory indexation of the tax schedules to inflation in general in Germany. However, two reports are crucial for updating the tax schedule every two years: the minimum subsistence level report and the tax progression report. The first one forecasts the tax-free subsistence level, that is relevant for the basic tax-free allowance and child tax allowance for the following two years. The tax progression report estimates the additional tax revenues due to 'cold progression' in the previous two years. Tax brackets are then usually updated for the following two years based on the price forecast of households' consumption expenditure.
- The current pension value ("Rentenwert"), which represents the current old-age pension claims for one year of average contributions and determines the basis for the level of old-age pensions, is adjusted annually according to the growth rate of gross earnings from dependent employees. The basic benefit rate for citizen's benefit (formerly citizen's benefit) and social assistance is adjusted annually through an inflation index calculated for a basket of goods and services which are determined by law to be necessary to cover basic needs. From 2023 on, the adjustment of the basic benefit rate is complemented by a forward-looking element to compensate for future price development.
- Consumption taxes consist of (1) VAT with two rates (standard 19 % and reduced 7 %), (2) harmonised excises on tobacco, alcohol (split up between different kinds of alcoholic beverages), energy and electricity, and (3) excise on coffee.
- The policy parameters saved as constants in the model and their values for the most recent year are available at https://euromod-web.jrc.ec.europa.eu/resources/parameters.

1.2 Social Benefits

Social benefits are grouped into benefits from the statutory unemployment insurance, the statutory health and accident insurances, the statutory pension insurance, and public transfers to private households.

1.2.1 Benefits from Statutory Unemployment Insurance

Unemployment Benefits I (*Arbeitslosengeld I*): Unemployed individuals, under the age of 65, who are generally able to work at least 15 hours per week, are entitled to "unemployment benefits I" in case they paid contributions to the unemployment insurance for at least 12 months within the two years preceding the unemployment spell. "Unemployment benefits I" are non-means-tested benefits. They amount to 60% of previous net earnings for childless individuals and to 67% for individuals with at least one child in terms of income tax law. Recipients are allowed to work up to 15 hours per week to top up benefits. The duration of entitlement to "unemployment benefits I" depends on the individual's age and number of months contributions were made in the previous 5 years. Unemployment benefits are subject to progression clause in income taxation (see Table 2.18).

Short-Term Work Compensations (*Kurzarbeitergeld*): Employees insured by the unemployment insurance are eligible to short-term work compensations in case their employers temporarily apply for short-term work due to business cycle effects or global economic downturn. In this case, 60% of the forgone net earnings are paid by the unemployment insurance (67% for employees with at least one child), usually for a time of up to twelve months. This time frame may be extended up to 24 months. Contributions to statutory social insurances are also paid for. Short-term work compensations are subject to progression clause in income taxation (see Table 2.18).

Transfer Short-Term Work Compensations (*Transferkurzarbeitergeld*): Transfer short-term work compensations are a special form of short-term work compensations. Employees generally eligible to short-term work compensations are entitled to transfer short-term work compensations in case their employers apply measures of operational restructuring, in turn of which the employee is endangered to become unemployed. Transfer short-term work compensations are paid for a time of up to 12 months, and levels correspond to the regulations for general short-term work compensations. They are subject to progression clause in income taxation (see Table 2.18).

Seasonal Short-Term Work Compensations (*Saison-Kurzarbeitergeld, formerly Wintergeld or Winterausfallgeld*): Seasonal short-term work compensations are supposed to foster employment in the construction sector during winter time. Employees in the construction sector who are unemployed during the months between December and March are generally entitled to seasonal short-term work compensations. The level of benefits corresponds to the level of general short-term work compensations. They are subject to progression clause in income taxation (see Table 2.18).

Insolvency Benefits (*Insolvenzgeld*): Employees insured in the unemployment insurance are eligible to insolvency benefits in case their employers become insolvent. In this case, the unemployment insurance pays the employees' net earnings – up to the contribution assessment threshold from the statutory pension insurance – for a time of three months following the insolvency. The benefit is financed by the unemployment insurance and by the employer who has to pay a special levy for insolvency (*Insolvenzumlage*). Since 2009 the levy has to be paid to the statutory health insurance. Insolvency benefits are subject to progression clause in income taxation (see Table 2.18).

Unemployment Benefits for Part-Time Unemployment (*Teilarbeitslosengeld*): Individuals who are working part-time in more than one job and lose less than all of their jobs are entitled to "unemployment benefits for part-time unemployment" if they have contributed to the statutory unemployment insurance for at least 12 months on *all* of their jobs. Benefits are paid for up to six months and levels correspond to the "unemployment benefits I". They are subject to progression clause in income taxation (see Table 2.18).

Benefits for Early Retirement (*Vorruhestandsgeld, Altersteilzeitzuschläge*): Employees may negotiate with their employers that they work part-time, i.e. 50% of their usual hours, from the age of 55 onwards. This can be implemented either continuously or blocked in years of full and zero hours. In this case, part-time earnings are increased by 20% in the form of benefits for early retirement, which are paid by the unemployment insurance provided that employees entered this arrangement before the end of 2009 and that the employer hires an additional employee to cover for the recipient of early retirement benefits. Otherwise, the employer has to pay for the benefits. Benefits for early retirement are income tax exempt, but they are subject to progressive taxation (see Table 2.18).

Benefit for Business Start-ups (*Gründungszuschuss*: *Förderung der Existenzgründung, Ich-AG und Überbrückungsgeld*): Recipients of unemployment benefits who start a business and become self-employed are eligible to business start-ups benefit during the first months following the start-up. Employment agencies pay benefits amounting to the level of previous unemployment benefits and a monthly lump-sum of 300 Euro for 6 months. The time frame for the lump-sum transfer may be extended up to 15 months if the business proves to be viable. Benefits are tax-free and not subject to progression clause in income taxation.

Benefits for Re-training (*Umschulungszuschüsse, Bildungsgutschein*): Unemployed individuals are generally eligible to re-training benefits, paid for by employment agencies, while they receive unemployment benefits I (or citizen's benefit or if they are threatened by unemployment). Benefits for re-training cover travel expenses, costs for overnight accommodations, meals, and child care costs. For the period of the funded training, recipients generally remain eligible for unemployment benefits I. However, rules for unemployment benefits, such as the frequency in which applications must be filed, remain unchanged during the training.

1.2.2 Benefits from Statutory Health and Accident Insurance

Maternity-Leave Benefits (*Mutterschaftsgeld*): All mothers who are employed and insured by the statutory health insurance, at the time when they go on maternity leave, are eligible to maternity-leave benefits. Maternity-leave benefits are paid by the statutory health insurance system for six weeks before the child's birth and eight weeks thereafter (time of maternity leave) in order to compensate foregone income from employment. Benefits are reduced if employment was less than full time. The remaining gap between maternity-leave benefits and the previous net labour income must be closed by the employer at the time of maternity leave. Maternity-leave benefits are subject to progression clause in income taxation (see Table 2.18).

Sickness Benefits (*Krankengeld der gesetzlichen sowie der privaten Pflegezusatz- oder Krankentagegeldversicherung*): All individuals insured by the statutory health insurance are entitled to sickness benefits. These are generally employees and recipients of unemployment benefits I, not however recipients of citizen's benefit. In case sickness prevents them from working, generally *the employer* is obliged to continue salary payment for a time of six weeks. Only after these six weeks, sickness benefits are paid for by the statutory health insurance. They generally amount to 70% of the previous gross earnings and at a maximum to 90% of previous net earnings. Social security contributions are subtracted from the benefit level, like from regular earnings -- however, only contributions to pension, long-term care, and unemployment insurance. Employer contributions are covered by the health insurance. In case of unemployed, where benefits are paid based on unemployment benefits I receipt, the health insurance covers also the employee social contributions.

Sickness benefits are paid for a time of up to 78 weeks for a specific illness. They are paid for a time of generally up to ten days if parents need to stay at home to care for their sick children (sickness benefits for care of sick children). Since January 2009, self-employed are only eligible to sickness benefit if they contribute to an additional health insurance, explicitly covering sickness

benefits. Sickness Benefits are subject to progression clause in income taxation (see above). Individuals insured by private health insurance, may in addition contribute to an insurance that pays sickness benefits from private long-term care insurance or daily sickness allowances from private health insurances.

Injury Benefits (*Verletztengeld*): Injury benefits are paid to employees who are insured by the statutory accident insurance and who are physically or mentally unable to pursue his work due to therapies or curative medical treatments that are related to an accident at work. During the first six weeks of sick leave, the employer is obliged to continue salary payment. After that, injury benefits are paid for up to 78 weeks. They amount to 80% of the previous foregone gross earnings and at maximum 100% of net earnings. Injury benefits are income tax exempt, but they are subject to progressive taxation. Moreover, regulations for the sickness benefits apply. Injury benefits are subject to progression clause in income taxation (see above).

Sickness Benefits for Military People (*Versorgungskrankengeld*): Sickness benefits for military people are paid to military people in case they get injured while pursuing military services. They amount to 80% of the previous foregone gross earnings and at maximum 100% of net earnings. Sickness benefits for military people are subject to progression clause in income taxation (see Table 2.18).

Severance Benefits (*Übergangsgeld*): Severance benefits are paid to heavily injured or physically or mentally disabled people who can temporarily not pursue full-time employment due to vocational further training or other measures of reintegration into the labour market. Recipients need to have contributed to the statutory unemployment insurance for at least 12 months in the previous 3 years. Benefits generally amount to about 68% of previous net earnings. In case of children eligible to child benefits in the household, benefits amount to 75% of net earnings. In case of self-employment the benefit amounts to 80% of last year's underlying income for the annual contribution. They are paid for up to three months. Severance benefits are subject to progression clause in income taxation (see Table 2.18).

Long-term Care Benefits (*Pflegegeld*): Long-term care benefits can be paid by the statutory accident insurance as well as the statutory long-term care insurance. If individuals insured in the statutory accident insurance are so helpless in consequence of the insured event that they require a considerable support for the common and recurring tasks in the course of daily life, long-term care benefits are paid and a nurse or home care is provided. Benefits from the statutory long-term care insurance are provided if eligibility does not stem from occupational illness or disability, mostly age-related. The concrete monthly amount of the benefit is determined by taking into account the nature or severity of health damage and the extent of assistance required.

Pensions from the Statutory Accident Insurance (*Rente der gesetzlichen Unfallversicherung*): Individuals insured in the statutory accident insurance are eligible to pensions if consequences of an accident are severe. Consequences of an accident are considered severe if they reduce the individual's earnings capacity by at least 20 %. In case of a loss of the entire earnings capacity, a pension is paid that amounts to two thirds of annual individual earnings.

Pensions for Disability to Work for Civil Servants (*Pension aufgrund von Dienstunfähigkeit*): If a civil servant becomes unable to work and then retires as a consequence of an accident at work, he receives a pension for disability to work. Benefit levels depend on prior earnings and prior work history as a civil servant.

1.2.3 Benefits from Statutory Pension Insurance

Old-Age Pensions (*Altersrente*): Individuals who contributed to the statutory pension insurance for at least five years are entitled to the regular old-age pensions from the age of 65 on. This

regular age for entry into old-age pension is gradually increasing for the younger cohorts up to 67, which will be the regular age in the year 2031. There are a few specific old-age pension schemes, in which entitlement may start some years earlier, e.g. severe disabilities or unemployment so that actual entries into old-age pensions may vary considerably over the individuals. The level of old-age pensions is determined individually by the contributions made, the age of entry into pension, and the current pension value.

In the course of the Retirement Income Act in 2005, taxation rules for income from old-age pensions were altered. Taxation of old-age pension income is gradually shifted to deferred taxation. While in 2009, the taxable fraction of old-age pensions amounts to 58% (so that 42% are tax free), it gradually increases every year, until it reaches 100% in the year 2040. At the same time, allowances to deduct contributions to old-age pension schemes from labour income are gradually increased in turn and are fully deductible from 2023 on.

Pensions for Reduced Ability to Work (*Erwerbsminderungsrente, Berufsunfähigkeitsrente, formerly also Erwerbsunfähigkeitsrente*): Pensions for reduced ability to work are paid to individuals who are insured in the statutory pension insurance and contributed at least five years, if their ability to work – any kind of work -- is permanently reduced. An individual's ability to work is considered permanently reduced if the individual is not able to work more than six hours per day anymore. If the individual is able to work more than three hours a day but not more than six, the individual's ability to work is considered partly reduced. It is considered fully reduced if the individual is not able to work three hours per day. According to the regulations for the regular old-age pension, the amount of pensions for reduced ability to work is determined individually by the contributions made, the age of entry into pension, and the current pension value. Recipients may have earnings from employment in addition up to limits that vary for partly and fully reduced abilities to work.

Survivor's (Widow's and Orphan's) Pensions (*Hinterbliebenenrente, including Witwenrente and Waisenrente*): Survivor's pensions include pensions for widows/widowers and pensions for orphans. There is a regular pension for widows and an extended one. The regular widow's pensions are paid to the surviving partner if the deceased person contributed to the statutory pension insurance for at least five years. Orphan's pensions are distinguished between orphans who lost one parent and orphans who lost both parents. Orphans who lost one parent who was insured in the statutory pension insurance receive 10% of the pension claims of the deceased parent. Orphans who lost both parents receive 20% of the average pension claims of both parents. Orphan's pensions are generally paid up to age 18. They can be prolonged up to a maximum age of 27 in case the orphan is disabled or in higher education.

Child-Care Pensions (*Erziehungsrente*): Child-care pensions are paid to divorced spouses upon the death of their ex-partner and widows/ widowers who contributed to the statutory pension insurance for at least five years, who did not marry again, and who care for a child younger than 18. There are differences in entitlements between East- and West-Germany according to the date of divorce. Child-care pensions are paid up to the 18th birthday of the child. They amount to the levels of a pension for fully reduced ability to work, where claims of the surviving person are relevant. Regulations for additional earnings from employment apply accordingly.

Supplementary Pension for Employees in Public Service (*Rente der Zusatzversorgungskassen des öffentlichen Dienstes*): The additional supply of pensions for employees in public service is related to the retirement system and provides a supplementary pension measure for employees in public services. Since January 2002 this kind of pension system was transferred to an employer pension scheme model, where the amount of the pension and the contributions comply with the "law to improve the occupational pension" ("Riester-Law II "). Contributions are paid directly out of gross income by the employer. They are determined by the relationship between the insured income and reference income and an age factor.

1.2.4 Pensions from Other Institutions:

Pensions from Employer Schemes (*Werks- und Betriebsrenten*): Employers voluntarily provide their employees, not necessarily all of them, with pensions from employer schemes, in case of retirement, disability or death. Typical recipients are employees, workers, or managers. If the employer commits to paying pensions from employer schemes this can be explicitly agreed upon in individual work contracts or in collective agreement contracts. Benefits can be paid on a regular, or an irregular basis, typically to pension funds.

Old-Age Pensions for Civil Servants (*Pension, Altersruhegehalt*): The old-age pension for civil servants is paid to officials, judges, soldiers and priests, church officials and other persons who are in civil servants, when they reach retirement age. The regular age for entry into old-age pension for civil servants is 65, as in the statutory old-age pension insurance. It will equally be increased gradually in the future. A retired civil servant is eligible to the old-age pension if a period of at least five years of service is completed. The amount of the pension depends on employment status (full- or part-time employment) and position of the individual in the public service (*mittlerer Dienst, gehobener Dienst, höherer Dienst*).

Pension Schemes for Self-Employed, Freelancers, and Farmers (*Rente berufsständischer Versorgungswerke, landwirtschaftlicher Alterskassen und Landabgaberenten*) and **Supplements to Old-age Pension Insurance Contributions for Farmers** (*Zuschüsse der landwirtschaftlichen Alterskassen*): Pension schemes for self-employed are based on a statutory compulsory membership for certain groups of free-lancers and they offer their members retirement, disability and survivors' benefits, which are contribution-based. Agricultural entrepreneurs, farmers, and their family members are insured in the pension schemes for farmers. The contribution scheme for farmers is similar to that of the statutory pension insurance.

Old-age Pensions from Foreign Countries (*Auslandsrente*): These pensions refer to income from pension systems from foreign countries. They presumable depend on contributions. Their levels may differ by countries.

1.2.5 Public Transfers to Private Households

Child Benefits (*Kindergeld*): Parents with dependent children are eligible to child benefits. Married couples can choose who receives the benefits. In case of parents living separately, the one with whom the child stays most of the time, or the one who bears the larger share of the maintenance, receives the benefits. Benefits are paid for biological, adopted, or foster children who live in the same household with their parents. They are paid up to the age of 18. Eligibility is prolonged up to the age of 25 in case children are still in education and do not work more than 20 hours a week in dependent employment. As an alternative to child benefits, parents can claim a child tax allowance at the derivation of taxable income. Tax authorities apply the more favourable of child benefits and child allowance for the parents according to a higher-yield test.

Parental-Leave Benefits (*Elterngeld, formerly also Erziehungsgeld*): Parental-leave benefits were implemented in 2007. They are non-means-tested benefits that generally replace between 65% and 67% of parents' foregone net labour earnings in case they suspend employment due to the birth of a child. Parental-leave benefits are paid – in addition to child benefits -- for a time frame of up to 12 months following the birth of the child, which can be prolonged for another two months if parents share parental-leave time such that each of them suspends work for at least two months. As an alternative to suspension, part-time work of up to 30 hours per week is allowed. The relevant net income is a twelve-month average net income of the time right before the child's birth. Parental-leave benefits are income tax exempt but subject to progression clause in income taxation (see Table 2.18).

Citizen's benefit, formerly unemployment benefits II (*Bürgergeld, formerly Arbeitslosengeld II*): All individuals aged between 15 and their pensionable age who are able to work for at least three hours per day are eligible for "citizen's benefit". "Citizen's benefit" are means tested with respect to income and wealth and they are determined by the needs of the family (partner – married or not – and dependent children, which sums up to the *Bedarfsgemeinschaft*). This means that the household's income and wealth are considered for the determination of needs, except for some allowances. This is usually done by a means test with regard to income and wealth. Depending on the number of household members the income threshold per month is calculated by the amount of the basic rates and the monthly rent including heating with regard to the household formation (lone parents or both parents are living in the household). However, unemployment is no requirement for entitlement, and there is no limitation for the hours worked. The resulting level of benefits is determined by the number of adults and children in the household, where for the latter age is of relevance. In addition to the basic benefits, costs for housing and heating, up to a maximum amount, which depends on the size of the household, are covered in the context of "citizen's benefit". Moreover, contributions to statutory health and old-age pension insurances are paid.

Additional Child Benefits (*Kinderzuschlag*): The additional child benefit is paid if households receive an income that covers the parents' needs according to "citizen's benefit", but not the needs of children younger than 25 who live in the same household. The level of the additional child benefits depends on the children's needs and the household's income and wealth. Eligible children are unmarried, live in the household, and are younger than 25 years. They also need to be eligible for child benefits. Own income of the child, market or replacement income, reduces the benefit amount. Household income must fall in a range in order for parents to be eligible to additional child benefits.

Social Assistance (*Sozialhilfe*): Individuals who are not able to work at least three hours per day – either because they are aged 65 or older, or because they are aged 18-65 and physically not able to work – are entitled to social assistance in order to secure a minimum income for everybody. These benefits are means tested with respect to income and wealth and they are determined by the needs of the entire household. This means that the household's income and wealth are considered for the determination of needs, except for allowances. In the case of general social assistance for reduced work, the income threshold per month is calculated by the amount of the basic rates and the monthly rent including heating with regard to the number of household members. The basic social assistance rate is identical to the basic rate from "citizen's benefit". Basically, social assistance is supposed to secure a minimum income for individuals who are not eligible for "citizen's benefit", i.e. those younger than 65 and not able to work at least three hours per day. Those 65 and older with very low pension income are however entitled to basic old-age assistance.

Means-tested Basic Old-Age Assistance (*Bedarfsorientierte Grundsicherung im Alter oder bei Erwerbsminderung*): The basic old-age assistance ensures the basic needs for living for older people and for those individuals, who are permanently fully incapacitated for work. Recipients must have 65 years of age, or 18 years of age and simultaneously be permanently fully incapacitated for work due to medical reasons. Claim for basic old-age assistance have individuals, who cannot support themselves with their own income and assets or with the income and assets of the non-separated spouse or consensual partner.

Social Benefits (*Sozialgeld*): Until 2022, individuals who were not able to work at least three hours per day, so that they were not eligible to "unemployment benefits II", and who live together with individuals who are themselves entitled to "unemployment benefits II", were eligible to social benefits. Social benefits are supposed to capture those people who would otherwise not be secured by social assistance. From 2023 on, social benefits have been discontinued and subsumed

with unemployment benefits II under the citizen's benefit. However, the eligibility criteria did not change.

Advances on Alimony Payments (*Unterhaltsvorschuss*): Up to 2016 (included), children under the age of 12 who only have a single mother or a single father (who may be divorced) are eligible to advances on alimony payments, if the other parent does not live in the same household and does not provide any alimonies, or the amount provided is below the minimum alimony. The maximum payment period is 72 months and interruptions in the payment period are possible, for example, because the other parent temporarily pays sufficient alimonies. If relevant, benefits are reduced by received child benefits and respectively by widow's pensions. As of 1 July 2017, children between 12 and 18 are also eligible to advances on alimony payments if they are not dependent on means-tested transfers or if they do receive means-tested benefits but their parent has a gross income of minimum 600 Euro (as described in the Sozialgesetzbuch II, SGB II). The maximum payment period of 72 months will no longer be applied.

Benefits from Non-Profitable Charity Organizations (*Geldleistungen von Wohlfahrtsorganisationen, e.g. AWO*): Non-profitable charity organizations support disadvantaged groups in the country. Their field typically includes social work (for children and young people, marginal groups, migrants, seniors, families, disabled, etc.), social care and poverty reduction, health promotion and prevention, care, counselling and / or training.

Housing Benefits (*Wohngeld*): Individuals in a household, in which the sum of income from all members does not exceed a threshold, are entitled to housing allowances. They may be renting or owning the house/flat. They are only explicitly eligible to housing benefits in case they do not receive "citizen's benefit" or social assistance. Otherwise, housing benefits are implied by "citizen's benefit". The level of benefits generally depends on the number of household members, the sum of their net incomes, where certain expenses for costs of living may be deducted up to certain thresholds, and the costs of rent or of loan repayments and maintenance, again up to thresholds. A permanent heating cost component as well as a climate component are part of housing benefits since 2023.

Education Benefits (*Ausbildungshilfen/BaFöG*): Students entering higher education before the age of 45 are eligible to financial aid according to the "*Bundesausbildungsförderungsgesetz* (*BaFöG)*". Education benefits are means-tested benefits. The benefit level depends on income and wealth of the recipient as well as on income of the recipient's parents and spouse. Moreover, it depends on the presence of siblings as well as their age and income. High school students do not need to repay any of the benefits. However, university students get half of the benefits in form of an interest-free loan that has to be paid back under certain conditions after education is finished.

Professional-Training Benefits (*Berufsausbildungsbeihilfe*): Individuals who are in professional training (e.g. apprenticeships) are eligible to professional-training benefits in case their earnings do not cover reasonable costs of living. In addition, the recipient either needs to pursue his training at a location too far away from his parents' home to commute, or the recipient needs to be 18 years old, married, or have a child. The level of benefits depends on income and wealth of the recipient as well as on income of the recipient's parents and spouse. Benefits are usually paid for up to 18 months.

Subsidization of Private Old-Age Pension Savings (*Förderung der privaten Altersvorsorge*): Asset accumulations for private old-age pension income are subsidized in the framework of the Riester-scheme (Riester benefits). Generally, all individuals who contribute to the statutory pension insurance are eligible to Riester benefits. Benefits are paid for contributions to state-certified savings contracts. Maximum benefits are only paid if a minimum share of gross income from the previous year is contributed to the certified savings contract.

Building Society Premiums (*Wohnungsbauprämie*): Building society premiums are paid for savings in building-society savings contracts. Savers are eligible to premiums if their taxable income falls below an upper limit. Savings to eligible contracts are subsidized up to a maximum amount per year, which differs for single individuals and married couples.

Savings Bonuses for Employees (*Arbeitnehmersparzulage*): Savings bonuses for employees are granted on contributions to capital formation that are directly invested by the employer out of basic salaries into various forms of savings contracts (*vermögenswirksame Leistungen*). Employees are eligible to these bonuses if their taxable income is below a given threshold. The level of bonuses depends on the type of savings contract.

Benefits for War Victims and Burden Sharing (*Kriegsopferversorgung und –fürsorge, Lastenausgleich*): Benefits for war victims and burden sharing are paid for military people in case they get injured while pursuing military services. Several single benefits are subsumed under benefits for war victims and burden sharing.

1.3 Social contributions

Employees and employers are obliged to pay statutory social insurance contributions (*Sozialversicherungsbeiträge*) from gross wages and salaries unless gross income exceeds certain thresholds, which allows employees to contract out of statutory health and pension insurance. In turn, social contributions grant benefit entitlements (see section 1.2). Employers withhold the employee's share of the social contributions when paying out the wage, and transfer them – together with their own share – to the employee's statutory health insurance fund, which is responsible for administration. Generally, the contributions are equally split between employees and employers.

Social insurance contributions are paid as fixed shares of gross income (contribution rates, *Beitragssätze*) up to a contribution assessment ceiling (*Beitragsbemessungsgrenze*). Gross income above this ceiling is disregarded. Employees who earn more than the assessment ceiling for statutory pension insurance may opt out of statutory pension insurance completely. Concerning statutory health insurance, a different threshold, i.e. the threshold for compulsory health insurance (*Versicherungspflichtgrenze*), determines who may opt out. Employees who earn salaries above this threshold may choose private health insurance instead. Private health insurance premiums do not depend on gross income, but mostly on age, gender, and prior health conditions.

Family insurance (*Familienversicherung*): 1) Partners (married or registered) with no or low income and 2) children of a (compulsory or voluntary) member of statutory health insurance enjoy health insurance coverage without having to pay contributions.

Mini job / midi job: Mini jobs (marginal or short-term employment) are tax-free and free of social insurance contributions for the employee. However, the employer has to pay contributions to statutory health and pension insurance. Mini jobs do not include contributions to the long-term care and unemployment insurance. In the case of midi jobs, employee's social insurance contributions are faded in linearly until they reach the full rates at a gross monthly wage of 2000 Euro Employers pay their standard contribution rates. These contributions are comprised of statutory health, long-term care, pension, and unemployment insurance. Fading-in of social contributions is determined by population-average social contribution rates.

Civil servants: Civil servants are not covered by compulsory social insurance and are not obliged to pay contributions. The federal or state government provides financial assistance (approximately 50% to 80% of the expenses) in cases of illness, birth, long-term care and death (*Beihilfeleistungen*) and a retirement pension (*Versorgungsbezüge*). Usually, civil servants have

a private health insurance to insure against health costs not covered by the government's financial assistance.

Self-employment: Statutory health insurance is generally not compulsory for the self-employed in Germany, and most of the self-employed choose private health insurance (Fossen, 2009). As an exception, artists and publicists are covered by compulsory statutory health insurance if certain requirements are met. Voluntary membership in statutory health insurance is possible for self-employed persons who fulfill the minimum requirement of previous contributions to statutory health insurance. The self-employed are not generally obliged to contribute to compulsory pension insurance, although specific groups of the self-employed (about a quarter of all self-employed) are obliged to contribute to statutory pension insurance (Schulze Buschoff, 2007). More relevant in practice are private pension insurance schemes – for example, state-aided basic pension schemes (*Rürup-Rente*). People becoming self-employed, having been dependently employed, have the option to stay in unemployment insurance upon application.

Others: Since 2009, all individuals are obliged to contract a health insurance. This implies that individuals who do not qualify for any of the categories listed also need to contract a health insurance. They are free to decide whether they would like to contract a public or a private health insurance.

1.4 Taxes

1.4.1 Direct Taxes

Income tax (*Einkommensteuer*): Income tax is levied on the income of natural persons. Income from various different sources is summed, and after loss compensation and several allowances and deductions, taxable income as the tax base is taxed according to a progressive tax schedule. Income from single components is added up and certain expenditures are credited against income, as well as certain allowances are granted. In the German income tax system in general, married couples are taxed jointly with full income splitting, i.e. the tax function is applied to half of the sum of the spouses' taxable incomes, and then the resulting tax amount is doubled. Tax on income from dependent employment is collected from persons in dependent employment at source via payroll tax (*Lohnsteuer*). Similarly, tax on capital income is collected at source via withholding tax (*Kapitalertragsteuer*, from 2009 onwards called *Abgeltungsteuer*). However, these taxes need not be final. It is common to file income tax returns, for example to claim income-related expenses which exceed the tax allowable lump sum for income-related expenses.

Solidarity Surcharge (*Solidaritätszuschlag*): Up to 2021 there was a surcharge of 5.5% on the income tax and the capital tax, which was originally motivated with the costs of the German re-unification. The solidarity surcharge will be partly abolished as of the year 2021. No solidarity surcharge is due on income tax up to 17,543 Euro (35,086 Euro for married couples). For exceeding amounts, a sliding scale is applied for taxable income up to 101,411 Euro (202,822 Euro for married couples). Taxpayers with taxable income above 101,411 Euro are fully subject to solidarity surcharge. The sliding scale will work as follows: (the yearly income tax – the freezone) x 0.119 = solidarity surcharge.

Church Tax (*Kirchensteuer*): Members of the catholic and protestant churches (and some smaller churches) pay this tax to finance their churches, which is collected by the government together with the income tax (respectively, the payroll tax and the withholding tax on capital income). The tax base is the income tax, which is used to apply a flat tax rate of 8% (in Bavaria and Baden-Württemberg) or 9% (in the other Federal States). Taxpayers can avoid paying the church tax by officially leaving church, which is why church tax may be regarded as voluntary.

Property Tax (*Grundsteuer*): A tax on real estate (land and buildings), based on the assessed tax value. Property Tax A applies to agriculture and forestry, and Property Tax B applies to other property. The tax rate varies over municipalities, as they can levy their own tax multiplier. First, to calculate the uniform basic tax (*Steuermessbetrag*), the assessed tax value is multiplied by a basic federal tax rate (*Steuermesszahl*), which is 0.6% for Property Tax A and 0.35% for Property Tax B (there are reduced rates for one and two family houses, and different rates for the Eastern federal states because of a different data basis for the assessed tax values). Second, the municipality specific multiplier (*Hebesatz*) is applied to the uniform basic tax to yield the tax liability.

Inheritance Tax (*Erbschaftsteuer*): A tax on capital transfer in case of inheritance. Capital transfers between living persons are similarly taxed by the gift tax (*Schenkungsteuer*). There is a tax free allowance whose amount depends on who is the recipient. There are also additional tax exemptions for business capital if the business (with its employees) is continued. Tax rates depend on the family relationship (partner, children, grandchildren, siblings, and other people) and are progressive in the tax base, with a minimum rate of 7% and a maximum rate of 50%.

Real property acquisition tax (*Grunderwerbsteuer*): Tax due when real property or shares of real property is transferred. The general tax rate is 3.5%, but the German states may choose different rates.

Motor Vehicle Tax (*Kfz-Steuer*): Tax paid by owners of motor vehicles, depending on cylinder capacity and carbon dioxide emissions. Lorries and trailers are additionally assessed on the basis of their maximum permissible gross weight.

Corporate Tax (*Körperschaftsteuer*): Tax on the income of corporations with a flat tax rate of 15%.

Local Business Tax (*Gewerbesteuer*): Both incorporated and non-incorporated business enterprises are liable to the local business tax, except for liberal professionals and farmers. This tax is the main source of revenue of German municipalities. Its tax base is primarily the enterprise's operating profit attributed to the local jurisdiction, augmented by certain fractions of interest and other financing expenses. Unincorporated firms benefit from an allowance. Tax rates vary over municipalities, as the local jurisdictions apply their own multipliers (similarly to the Property Tax, see above). Sole proprietors and partners of non-incorporated firms can credit at least parts of the local business tax against their personal income tax (PIT) liability, depending on the size of the multiplier.

1.4.2 Indirect Taxes

Value Added Tax (*Umsatzsteuer*/*Mehrwertsteuer*): Tax on almost all consumption expenses. Technically, it is collected from the enterprises selling goods and services. These enterprises can claim back the VAT paid for their inputs. The general tax rate is 19%. A reduced rate of 7% applies for most foodstuffs and certain other basic necessities, and since 2010 also for overnight stays in hotels[1].

Insurance tax *(Versicherungsteuer)***:** Tax on insurance contributions or premiums except for statutory and private life and health insurance and statutory unemployment insurance. The tax rate is generally 19%; other rates apply for specific insurances.

Excise taxes *(Verbrauchsteuern)*: Specific taxes on the consumption or usage of certain goods. Most revenue is collected from the energy tax (*Energiesteuer*), which is a tax on all fossil and

[1] Full list on goods with reduced rate or tax exemption can be found: https://www.gesetze-im-internet.de/ustg_1980/__12.html and https://www.gesetze-im-internet.de/ustg_1980/anlage_2.html

biological energy carriers, the tobacco tax (*Tabaksteuer*) and the electricity tax (*Stromsteuer*) Further excise taxes are of minor importance and are mostly levied on different kinds of alcoholic beverages and products, like the alcohol tax (*Alkoholsteuer)*, beer tax (*Biersteuer*) or sparkling wine tax *(Schaumweinsteuer*). All excise taxes are unit taxes with differentiated tax rates depending on specific characteristics of the taxed good, e.g. beverages with higher volumes of alcohol face typically higher tax rates.

2. SIMULATION OF TAXES, SOCIAL INSURANCE CONTRIBUTIONS AND BENEFITS IN EUROMOD

2.1 Scope of simulation

As a tax and benefit microsimulation model covering all EU member countries, the scope of EUROMOD must necessarily be limited to simulating policies, for which information provided in the data is sufficient to adequately implement the single factors of relevance in the respective policy regulations. In the case of Germany, this does not hold for all policies presented in Sections 1.2, 1.3 and 1.4. The main limitations with respect to simulation of the tax and benefit rules in EUROMOD are related to insufficient information, such as the contribution history or the earnings history of the potential recipients of a benefit, e.g. for the simulation of contributory old age benefits information on the history of the individual is required. This data is indispensable for a proper simulation, and since it is missing in SILC no simulation of the respective policy is possible. Another example would be indirect taxes, which are as well beyond the scope of EUROMOD because of lack of information on expenditures in SILC.

Table 2.1 and Table 2.2 tabulate all policies that are relevant in the context of EUROMOD. They are relevant because they are either explicitly simulated in EUROMOD, or because they are not explicitly simulated, but implicitly, as they are interrelated to other policies that are either explicitly simulated or that are in turn interrelated to simulated policies. The most relevant variable in this context is income from employment and pensions. On the one hand, it is a function of some policies, such as social insurance contributions, simulated or not simulated, and on the other hand it is an input variable in certain simulated policies that condition eligibility on a means test. Such interdependencies are further treated in the next section. Firstly, all policies are categorized in Table 2.1 and Table 2.2 into such that are simulated and such that are not simulated. For the latter, relevant information on the main limitations for simulation are provided.

Generally, most of the social benefits, which merely condition on a means test, are simulated, some with more or less restrictive assumptions (Table 2.1). More on these assumptions will be said in Sections 2.5, 2.7 and 2.8. However, most of the contributory benefits, most of them relating to all kind of pensions, are not simulated, due to lack of sufficient information on the contribution history. Moreover, many benefits for sickness or disability are not simulated, as there is not enough information reported on the duration and type of sickness or injury, and on the degree of disability. Furthermore, the degree of loss of the earnings capacity in relation to injury or disability would be valuable information that is not sufficiently observed in the data.

Some policies could only partly be simulated, as some regulations are not simulated due to a lack of sufficient information in the micro data. Education benefits (BaFöG) belong to this group of policies. For students who do not live with their parents, there is a lack of information on income and wealth of their parents. Simplifying assumptions have though been made in order to also simulate education benefits for students living on their own. For students who do live with their parents this information is observed or can be estimated.

Policies that are neither observed in the micro data nor simulated in EUROMOD are completely excluded from the model. Such policies from the statutory unemployment insurance are short-term work compensations, transfer short-term work compensations, seasonal short-term work compensations, insolvency benefits, as well as benefits for part-time unemployment, benefits for early retirement, benefits for business start-ups, and benefits for re-training. From the statutory accident insurance, the non-simulated benefits are injury benefits, sickness benefits for military people, and severance benefits. From the statutory pension insurance, these are child-care pensions and supplementary pensions for employees in public service. Then there are pensions from other institutions, e.g. pensions from employer schemes, and pensions from schemes for self-employed, freelancers, and farmers, which are also not simulated. Finally, there are public transfers to private households that are not included in the data, and hence excluded from EUROMOD, such as professional training benefits, subsidizations of private old-age pension savings, home-building allowances, building society premiums, and savings bonuses for employees.

Table 2.1 Simulation of benefits in EUROMOD [2021-2024]

	Variable name(s)	Treatment in EUROMOD				Comments
		2021	2022	2023	2024	
Benefit for early retirement	byr	I	I	I	I	Missing data on contribution history & wage history
Citizen's benefit	bunnc_s	S	S	S	S	
Unemployment benefits I	bunct_s	PS	PS	PS	PS	Missing data on Contribution history
Severance pay	ysv	I	I	I	I	Missing data on Job termination
Covid-related wage compensation for employees	bwkmcee_s	S	S	S	S	Need to simulate transitions into wage compensation scheme
Covid-related financial help for self-employed	bencovidse_s	-	-	-	-	Policy is turned off in the baseline due to missing information on Covid-related decrease in self-employed income.
Benefit for start-ups	bunot	I	I	I	I	Missing data on self-employed & their business history
Benefit for re-training	buntr	I	I	I	I	Missing data on unemployed; eligibility for re-training
Lump-sum unemploy. benefits	bunls	I	I	I	I	Job termination
Old-age statutory pension	poass	I	I	I	I	Contribution & wage history
Old-age pension (employees)	poa00	I	I	I	I	Contribution history
Foreign old-age pension	poaab	I	I	I	I	Occupation in a foreign country
Old-age pension (self-employed)	poaps	I	I	I	I	Contribution history
Old-age pension (empl. pub. serv.)	poapu	I	I	I	I	Employment history
Old-age pension (civil servants)	poacs	I	I	I	I	Employment history
Old-age pension (disability)	poadi	I	I	I	I	Employment history; degree of injury

Benefits for war victims (older than 65 years)	poawr	I	I	I	I	Participation in military services
Orphan's pension	psuor	I	I	I	I	Biography; contributions of deceased
Survivor's pension	psuwd	I	I	I	I	Biography; contributions of deceased
Benefits for war victims (younger than 65 years)	pdiwr	I	I	I	I	Participation in military services
Sickness benefits	bhl_s	PS	PS	PS	PS	Employment history; sickness severity
Care benefits from long-term care insurance	pdica	I	I	I	I	Degree of injury; cash and in-kind benefits
Disability pensions for civil servants	pdiot	I	I	I	I	Employment history; injury
Pensions for reduced work ability	pdi00	I	I	I	I	Employment history; injury
Pension from accident insurance	pdiss_s	PS	PS	PS	PS	Injury and remaining earnings capacity
Maternity-leave benefit	bmact_s	PS	PS	PS	PS	Contribution history
Parental-leave benefit	bplct_s	PS	PS	PS	PS	Employment history
Add. child benefit (*Kinderzuschlag*)	bchot_s	S	S	S	S	
Child benefits	bch00_s	S	S	S	S	
Covid-related benefit for children *(Kinderbonus)*	bencovidch_s	S	S	-	-	
Lump-sum energy transfer (*Energiepreispauschale*)	blsxp_s	-	S	-	-	
Heating bonus (*Heizkostenzuschuss*)	bhtxp_s	-	S	.	.	
One-off payments for unemployed and recipients of social assistance	bsaxp_s	-	S	-	-	
Educational allowance	bched_s	PS	PS	PS	PS	Mix of cash and in-kind benefits
Advances on alimony payments	bcham	I	I	I	I	Alimony payments
Other family benefits	bfaot	I	I	I	I	Aggregate of very minor benefits
Social benefits (*Sozialgeld*)	bsaot_s	S	S	S	S	
Social assistance (*Sozialhilfe*)	bsa00_s	S	S	S	S	
Basic old-age assistance	bsaoa_s	S	S	S	S	
Benefits from charity organizations	bsapu	I	I	I	I	
Contributions to agricultural pension funds	bsa01	I	I	I	I	
Education benefits	bed_s	PS	PS	PS	PS	Missing data on data on parents' income (if on their own)
Housing Benefits	bho00_s	S	S	S	S	
Professional Training Ben.	-	E	E	E	E	Professional training & parental income

Subsidies for prv. old-age savings	-	E	E	E	E	Savings
Home-building allowances	-	-	-	-	-	Housing purchases
Building society premiums	-	E	E	E	E	Savings
Savings bonuses for employees	-	E	E	E	E	Savings

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

The simulation of taxes and social insurance contributions for Germany is limited in EUROMOD to direct taxes, i.e. the personal income tax and capital income tax, as well as mandatory contributions to the social security systems. Personal income taxation is treated in two different policies for individual and joint taxation, mainly for the sake of a clear representation.

Social security contributions are differentiated by such contributions paid for by the employer, by employees, by self-employed, and by pensioners. Contributions paid for by the employer and by employees are simulated for regular, full- or part-time employment, as well as for marginal (or short-term) employment in the context of the so-called mini jobbers and midi jobbers, for which contribution rates differ. Contribution rates simulated for self-employed are restricted to pension insurance contributions for certain industries (education, health), where self-employed are obliged to contribute to the statutory pension insurance. For pensioners, only contributions to health insurance and long-term care insurance are relevant. More details will be presented in Section 2.7.

Table 2.2 Simulation of taxes and social insurance contributions in EUROMOD [2021-2024]

	Variable name(s)	**Treatment in EUROMOD**				**Comments**
		2021	**2022**	**2023**	**2024**	
Taxes						
Income Tax: tax allowances and taxable income	tin_s	S	S	S	S	
Individual Taxation	tinit_s	S	S	S	S	
Joint Taxation	tinjt_s	S	S	S	S	
Capital income taxation	tinkt_s	S	S	S	S	
Value Added Tax		S	S	S	S	Calculations based on extended input files with consumption expenditures from HBS
Excise duties		S	S	S	S	Calculations based on extended input files with consumption expenditures from HBS
Social Insurance Contributions						
Employer	tscer_s	S	S	S	S	
to pension insurance	tscerpi_s	S	S	S	S	
to health insurance	tscerhl_s	S	S	S	S	

to long-term care insurance	tscerci_s	S	S	S	S	
to unemployment insurance	tscerui_s	S	S	S	S	
to accident insurance	tscerac_s	S	S	S	S	
Employee	tscee_s	S	S	S	S	
to pension insurance	tsceepi_s	S	S	S	S	
to health insurance	tsceehl_s	S	S	S	S	
to long-term care insurance	tsceeci_s	S	S	S	S	
to unemployment insurance	tsceeui_s	S	S	S	S	
to accident insurance	tsceeac_s	S	S	S	S	
Self-employed	tscse_s	S	S	S	S	Many social contributions for the self-employed are voluntary, and they are not observed.
to pension insurance	tscsepi_s	S	S	S	S	Pension insur. for self-employed is voluntary
Pensioner	tscpe_s	S	S	S	S	
to health insurance	tscpehl_s	S	S	S	S	
Other						
to health insurance	tscot_s	S	S	S	S	People with no or low earnings; minimum amount assumed

Notes: "-" policy did not exist in that year; "E" policy is *excluded* from the model's scope as it is neither included in the microdata nor simulated by EUROMOD; "PS" policy is *partially simulated* as some of its relevant rules are not simulated; "S" policy is *simulated* although some minor or very specific rules may not be simulated.

2.1.1 Partially simulated tax-benefit components

The *unemployment benefit I* (EUROMOD variable bunct_s) is partially simulated. As information on past earnings is not available in SILC, we impute them using information on the reported receipt of the benefit (bunct) in SILC. Thus, the simulation is restricted only to those individuals who have reported the unemployment benefit I in the micro-data.

Sickness benefits (EUROMOD variable bhl_s) are also partially simulated. This is for the following two reasons: First, as information on prior earnings is not available in SILC, we impute them using information on the reported receipt of the benefits (bhl) in SILC. Thus, the simulation is restricted only to those individuals who have reported sickness benefits in the micro-data. Second, as information on the degree of disability is not available in SILC, we simplify the simulation by assuming that each entitled individual gets the minimum benefit amount.

For similar reasons (missing information on the contributory history, the entitlement basis and the degree of disability) the *disability pension from the statutory accident insurance* (EUROMOD variable pdiss_s) is partially simulated.

The *maternity leave benefit* (EUROMOD variable bmact_s) and *parental leave benefit* (EUROMOD variable bplct_s) are also partially simulated because for full simulation more information on when the child was born, the contributory history and the hours worked is needed. As with the benefits mentioned above, information on past earnings is imputed using information on the reported benefit receipts (bmact and bplct) in the SILC data.

The *education benefit* (EUROMOD variable bed_s) is partially simulated because parents' income and wealth is not observed for the students who no longer live with their parents. Although efforts have been made to impute parents' income for this sample of students, the simulation of the benefit is restricted to those students who report the benefit (bed) in the SILC data. The benefit is fully simulated for students who still live with their parents.

The *education allowance* (EUROMOD variable bched_s) is partially simulated. Although we simulate the main benefit component, there are additional amounts which are a mixture between cash and in-kind benefits and depend on the region. As we cannot distinguish between the cash and in-kind benefits, we cannot simulate the entitlement to them.

The *deduction of childcare expenses* (EUROMOD variable tintace_s) is partially simulated because there is no information on the actual childcare expenses. Instead, we make assumptions about which families may be entitled to the deduction and simulate for them the maximum deduction amount.

Finally, the *deduction of income-related expenses* (EUROMOD variable tintaee_s) is partially simulated because we simulate only the minimum lump-sum amount, as we do not have information on other types of expenses.

2.2 Main policy changes [2021 –2024]

Policies	2021 → 2022	2022 → 2023	2023 → 2024
Benefits	Several one-off payments	Reform of social assistance (*Bürgergeld),* housing benefits and education benefits	
Social insurance contributions		Increase of mini- and midi-job thresholds	Change in long-term care contributions
Direct taxes	Increase of basic allowance and allowance of income-related expenses	Significant adjustment of income tax brackets due to high inflation	
Consumption taxes	- introduction of reduced VAT rate on natural gas purchases - temporary decrease of energy tax on fuels		Return to full VAT rate for food in restaurants and natural gas purchases
Other			

2.3 Order of simulation and interdependencies

Table 2.3 tabulates the order in which the single policies are simulated in EUROMOD. The order in which the policies are simulated is made explicit in Table 2.3. This order is mainly determined by interdependencies between the policies, as far as these could have been considered in the model. These interdependencies shall be briefly described in the following.

Minimum wage is simulated upfront. Right after, a preliminary simulation of contributory unemployment benefits is carried out. This enables to identify the recipients of disability benefits as individuals who are not working, do not receive unemployment benefits and do not actively search for a job. In turn, this allows simulating disability pensions, which enter the income base that determines the contributions to social security of pensioners. Next, contributions to social security systems are simulated. Except for the social security contributions of pensioners, these policies only condition on observed income from employment. In case minimum wage is switched on, it replaces observed employment income where relevant. The first social benefits simulated are child benefits. They are independent of any income or wealth. Then come the actual (final) simulation of contributory benefits from the unemployment insurance, i.e. unemployment benefits I, which are computed again from scratch, this time making use of the information about social security contributions generated previously. By their contributory nature, they condition on income in past periods, but not on income in the current period.

Then comes a benefit that does not condition on any of the benefits simulated so far, but that is itself an input into benefits simulated at a later stage. Sickness benefits are a function of unemployment benefits I when benefit levels are calculated. Thereafter, maternity leave benefits and parental leave benefits are simulated. Both are a function of employment income as well as unemployment benefits I.

Then, taxation is simulated. Thereby, all relevant benefits can be considered in the simulation of personal income taxation. This is necessary because some benefits belong to taxable income, while other benefits are excluded from the calculation of taxable income but are considered at the determination of the relevant tax rate (progression clause). As a result, almost all benefits simulated are considered at income taxation.

Next education benefits are simulated. They condition on income and wealth of the students as well as their parents, where observed current income is applied. In addition, simulated social security contributions and taxes paid by students and their parents are taken into account, as they play a role in determining the amount of the benefit.

Next, housing benefits are simulated. Relevant income in the sense of housing benefits is computed taking into account whether individuals pay income taxes and/or social security contributions.

Then, citizen's benefit, the first means-tested benefit, are simulated. They are non-contributory benefits, conditioning eligibility on a means test, for which all benefits and taxes simulated earlier are an input, and on ability to work.

Next, means-tested social benefits that have the scope to secure a minimum income are simulated. These are old-age social assistance, general social assistance including social benefits for children, and additional child benefits. All these benefits condition eligibility on disposable income after all other benefits are considered, especially after citizen's benefit are considered. They mainly cover those individuals that are not eligible to citizen's benefit because they are permanently not able to work a minimum number of hours per day, either because they are disabled, or because they are permanently injured, or because they are too old.

Finally, additional child benefits and educational allowances are simulated.

Table 2.3 EUROMOD Spine: order of simulation

Policy	2021	2022	2023	2024	Description of the instrument and main output
setdefault_de	on	on	on	on	DEF: SET DEFAULT VALUES
uprate_de	on	on	on	on	DEF: UPRATING FACTORS
constdef_de	on	on	on	on	DEF: constants
ilsdef_de	on	on	on	on	DEF: STANDARD INCOME CONCEPTS
ilsudbdef_de	on	on	on	on	DEF: STANDARD UDB INCOME CONCEPTS
ildef_de	on	on	on	on	DEF: NON-STANDARD INCOME CONCEPTS
Random_de	on	on	on	on	DEF: random assignment for Covid-related policies
TransLMA_de	on	on	on	on	DEF: select individuals that do the transitions to wage compensation/unemployment (LMA transition)
tudef_de	on	on	on	on	DEF: ASSESSMENT UNITS
yem_de	switch	switch	switch	switch	INC: Minimum Wage
neg_de	on	on	on	on	INC: recode negative values of incomes to zero
bunct_de	on	on	on	on	BEN: unemployment benefits I (ALG I)
bwkmcee_de	on	on	on	on	BEN: Wage compensation scheme (Kurzarbeitergeld)
bencovidse_de	off	off	off	off	BEN: financial help for self-employed
yseadj_de	off	off	off	off	INC: Self-employment income recalculation after financial help
pdiss_de	on	on	on	on	BEN: disability pension from stat. acc. Insurance (Rente der gesetzlichen Unfallversicherung)
tscer_de	on	on	on	on	SIC: employer social insurance contribution
tscee_de	on	on	on	on	SIC: employee social insurance contribution
tscse_de	on	on	on	on	SIC: self-employed social insurance contribution
tscpe_de	on	on	on	on	SIC: pensioner social insurance contribution
tscot_de	on	on	on	on	SIC: other social insurance contribution
bch00_de	on	on	on	on	BEN: child benefits (Kindergeld)
bencovidch_de	on	on	n/a	n/a	BEN: covid benefit for children (Kinderbonus)
bunct_de	on	on	on	on	BEN: unemployment benefits I (ALG I) (repetition of policy with order 8)
bhl_de	on	on	on	on	BEN: Sickness Benefits (Krankengeld der GKV, prvt. Pflegezusatz- oder Krankentagegeldversicherung)
bmact_de	on	on	on	on	BEN: maternity leave
bplct_de	on	on	on	on	BEN: parental leave
blsxp_de	n/a	on	n/a	n/a	BEN: Lump-sum energy transfer (Energiepreispauschale)
tinkt_de	on	on	on	on	TAX: capital income taxation
tin_de	on	on	on	on	TAX: income taxation (Einkommensteuer): taxable income
tinit_de	on	on	on	on	TAX: income taxation (Einkommensteuer): individual taxation
tinjt_de	on	on	on	on	TAX: income taxation (Einkommensteuer): joint taxation
bed_de	on	on	on	on	BEN: education benefits (BaFöG)
bho00_de	on	on	on	on	BEN: housing benefits (Wohngeld)
bhtxp_de	n/a	on	n/a	n/a	BEN: Heating bonus (Heizkostenzuschuss)
bunnc_de	on	on	on	on	BEN: citizen's benefit (Bürgergeld)
bsaot_de	on	on	on	on	BEN: citizen's benefit (Bürgergeld), formerly social benefits (Sozialgeld)

bsaoa_de	on	on	on	on	BEN: old-age social assistance (Grundsicherung im Alter)
bsa00_de	on	on	on	on	BEN: general social assistance (Sozialhilfe)
bsaxp_de	n/a	on	n/a	n/a	BEN: One-off payments for unemployed and recipients of social assistance
blsxpsd_de	n/a	n/a	on	on	BEN: Lump-sum energy transfer for students
bchot_de	on	on	on	on	BEN: additional child benefits (Kinderzuschlag)
bched_de	on	on	on	on	BEN: child benefits: educational allowance (Bildungspaket)
tco_de	on	on	on	on	TAX: Commodities
output_std_de	on	on	on	on	DEF: STANDARD OUTPUT INDIVIDUAL LEVEL
output_std_hh_de	on	on	on	on	DEF: STANDARD OUTPUT HOUSEHOLD LEVEL

2.4 Policy extensions

- **Minimum Wage Adjustment (MWA)**, allowing the user to switch on/off the minimum wage simulation. The default for the baselines is OFF. When switched on, a parameter for an hourly minimum wage, valid for all employees, must be specified. The policy then simulates minimum earnings based on the minimum wage and assigns the greater of minimum wage and actual earnings to the individual, for all months in the base year in which the individual was employed[2].
- **Benefit Calibration Adjustments (BCA**), allowing the user to calibrate the receipt of benefits to match the simulated total expenditure of a benefit to real expenditure from external statistics. The extension is implemented for the simulation of the housing benefit (bho00_de), the citizen's benefit/unemployment benefits II (bunnc_de) and the additional child benefit (bchot_de). The default for the baseline is OFF. When the extension is on, a subset of eligible of observations is selected randomly as beneficiaries so that the real expenditure is reached, removing the benefit from the rest of the eligible observations; when off, all eligible observations are kept as beneficiaries. This extension shares most of its functions with the BTA extension; as a general rule, only one of the extensions should be on, but if both are, the lowest rate between the take-up rate and the calibration rate will be applied. More details on the specific implementation of BCA and BTA extensions are provided in the subsections describing the corresponding benefits.
- **Benefit Take-up Adjustments (BTA),** allowing the user to apply non-take-up corrections. The extension is used for the simulation of the housing benefit (bho00_de)3, the citizen's benefit/unemployment benefits II (bunnc_de)4 and the additional child benefit (bchot_de) 5. The default for the baseline is OFF. When the extension is on, a

[2] A minimum wage was introduced on 1 January 2015 in Germany. It applies to each individual aged at least 18 and it amounted to 9.50 Euro in 2021. By the beginning of 2022 minimum wage increased to 9.82 Euro per hour. However, there have been two further adjustments in 2022, with an increase to 10,45 Euro per hour by the 1st of July and to 12 Euro per hour by the 1st of October. In 2024 the minimum wage increased to 12.41 Euro. Compulsory internships in the context of university education are excluded from the minimum wage.

[3] Estimation of non-take-up from external source: https://econpapers.repec.org/article/palcompes/v_3a60_3ay_3a2018_3ai_3a4_3ad_3a10.1057_5fs41294-017-0041-5.htm

[4] Estimation of non-take-up from external source: https://doku.iab.de/discussionpapers/2019/dp0619.pdf

[5] Estimation of non-take-up from external source: https://econpapers.repec.org/article/palcompes/v_3a60_3ay_3a2018_3ai_3a4_3ad_3a10.1057_5fs41294-017-0041-5.htm

share of (weighted) eligible observations equal to the take-up rate is selected randomly as beneficiaries, removing the benefit from the rest of the eligible observations; when off, all eligible observations are kept as beneficiaries. This extension shares most of its functions with the BCA extension; as a general rule, only one of the extensions should be on, but if both are, the lowest rate between the take-up rate and the calibration rate will be applied. More details on the specific implementation of BCA and BTA extensions are provided in the subsections describing the corresponding benefits.

- **HHoT – Unemployment extension (HHoT_un):** this extension improves the simulation accuracy of the unemployment insurance benefit when EUROMOD is run with hypothetical data. For instance, in most countries the legislation of this benefit requires information on variables such as individuals' employment history, which are not available in SILC; we can define these variables in HHoT and use them to simulate the policy's rules more precisely when running the model with hypothetical data. This extension is set to on when the model is used with HHoT data.

2.5 Benefits

2.5.1 Child Benefits (*bch00_de*)

Child benefits are monthly non-means-tested non-taxable benefits paid to families with dependent children below an age limit. Benefit levels depend on how many children there are in the household.

- ***Definitions***

The unit of analysis is the family. Families include couples and their own, as well as loose dependent children. Dependent children are biological, adopted, or foster children who live in the same household with their parents.

- ***Eligibility Conditions***

There are two groups of eligible children.[6] 1) Generally, eligible children can at maximum be aged 18. 2) The age limit is extended to 25 in case children are still in tertiary education and, until 2011, in case their income did not exceed a threshold (see Income Test). From 2012 on, the income limit has been replaced by a limit on hours worked by the child. If the child is disabled, and has been disabled since the age of 25 at least, no age limit applies. In case of parents living separately, the one with whom the child stays most of the time, or the one who bears the larger share of the maintenance, receives the benefits.

- ***Income Test***

N/a.

- ***Benefit Amount***

The benefit is paid monthly to one of the parents. The benefit amounted to 192 Euro for the first two children, 198 Euro for the third child, and 223 Euro for the fourth and all following children in 2017. In 2018 and the first half of 2019, benefits amounted to 194 Euro per month for the first two children, 200 Euro for the third child, and 225 Euro for the fourth and all following children.

[6] Strictly speaking eligibility is related to the parents, not to the children. However, we will be speaking of eligible children, as it effectively makes no difference, given the eligible criteria are related to the children, and in the simulation, benefits are first assigned to the children, too, and later aggregated at household level and assigned to the head.

From July 2019 on, benefit amounts are further increased by 10 Euro per month and child, however, these changes will only be modelled from 2020 onward, since they enter into force after June 30, 2019. From January 1st, 2022 the benefit amounts to 219 Euro for the first two children, 225 euro for the third child and for the fourth and following children parents receive 250 Euro. In 2023 and 2024 the benefit is uniformly 250 Euro for every child in the household.

- ***EUROMOD modelling***

It is assumed that disabled children have been disabled since the age of 25 at least. Means tests and benefit assignment are simulated separately for children living with their parents and children living on their own. For children not living with their parents, it is assumed that they are first or second child. For them, eligibility is not limited to single or couple households. They may rather have their own children who are eligible to child benefits, too.

2.5.2 Unemployment Benefits I (*bunct_de*)

Unemployment benefits I are contributory benefits, which means that eligibility and benefit amounts depend on the amount and time for which contributions were made. As contributions are not observed in the data, they are approximated by observed information.

- ***Definitions***

Approximation of contribution history is applied differently for three groups: 1) those who are currently employed and not in receipt of unemployment benefits I, 2) those currently unemployed and in receipt, and 3) those unemployed, but not in receipt. Unit of analysis is the individual.

- ***Eligibility Conditions***

Unemployed individuals, under the age of 65, who are generally able to work at least 15 hours per week, are entitled to unemployment benefits I in case they contributed to the unemployment insurance for at least 12 months within the two years preceding the unemployment spell, meaning they were employed during that time.

- ***Income Test***

Unemployment benefits I are contributory benefits. There is no income or wealth test, in the sense of a means test, to these benefits. But see the restrictions for additional earnings from employment under Benefit Amount.

- ***Benefit Amount***

They amount to 60% of previous net earnings for childless individuals and to 67% for individuals with at least one child in terms of income tax law. Recipients are allowed to work up to 15 hours per week to top up benefits. Earnings from employment of up to 15 hours per week reduce the amount of benefits paid; an allowance for earnings of 165 Euro per month is granted. Earnings above this allowance reduce the benefit level.

- ***Benefit Duration***

The duration of entitlement to “unemployment benefits I” depends on the individual’s age and number of months contributions were made in the previous five years. Generally, contributions made for 12 months entitle to six months of benefits, whereas benefits are paid for a maximum of 12 months for individuals who paid contributions for 24 months. People aged between 50 and 55 are eligible to a maximum of 15 months benefit receipt for 30 months of contributions. For individuals who are aged 55 or older, 16 months of contributions entitle to 8 months of receipt, 20 months of contributions entitle to 10 months of receipt, and 36 months of contributions entitle

to 18 months. People aged 58 or older are entitled to 24 months of benefit receipt in case they contribute for 48 months. Table 2.4.3 provides a summary of the benefit rules:

Table 2.4.3 Characteristics of the unemployment benefit

		2021-2024
Eligibility	Contribution period	Min of 12 months over the last 2 years
	Other conditions	Less than 65, able to work 15 hours per week, no receipt of old-age pension
	Eligibility of self-employed	n/a
Payment	Contribution base	Net (of income tax and employee SIC) earnings
	Basic amount	60% of previous net earnings for childless individuals and 67% of previous net earnings if with at least 1 child
	Additional amount	The health insurance contribution (tscot_s) is paid with the benefit
	Floor	n/a
	Ceiling	The ceiling is applied on previous gross earnings up to 7,550 (West Germany) or 7,450 (East Germany) Euro per month in 2024
Duration	Standard (in months)	6 months (if contributed for 12 months) up to 12 months (if contributed for 24 months)
	Special cases (in month)	8 months (if aged 55+ and contributed for 16 months), 10 months (if aged 55+ and contributed for 20 months) (other special cases are not simulated as entitlements exceeds 12 months)
Subject to	Taxes	Enters the 'progression clause' income list
	SIC	n/a

- ***EUROMOD modelling***

The main limitation for simulation of contributory unemployment benefits is the fact that the contribution history is not observed in the data. Thus, contributions made have been approximated with the number of months ever employed (*liwwh*). Benefit duration is imputed according to the number of months ever in work and the rules for duration (see Benefit Duration). All those with 36 months and more, who are aged 55 and older, get the maximum duration of 18 months imputed. However, as duration is only simulated for one year, months of entitlement are capped at the observed number of months spent in unemployment (or the number of months benefits were received, in case this is larger).

Then, the contribution history is simulated for three groups of potential recipients. Generally, observed months contributed (*liwmy*) are aggregated up over the entire qualifying period (24 months). 1) For those employed and in receipt (*bunct>0*), aggregated observed months are applied. This means it is assumed that they have contributed, i.e. they have been employed, over the entire last 24 months. 2) For those unemployed and not in receipt (*lunmy_s>0 & bunct=0*), it is assumed that they have not contributed the minimum requirements for any receipt and they get zero months imputed.

Based on simulated contribution histories and spell durations, benefit amounts are simulated. Eligibility in general is conditioned on minimum contributions (*liwmy_s*), age in band of minimum 18 and maximum 65, no receipt of old-age pensions (*poa*), and a maximum of 15 hours worked per week (*lhw*). Now the entitlement basis is applied. As it is not observed, a proxy for it,

which has been generated by inverting the benefit function for several contributory benefits, is applied (*i_ntpy*, also see Section 3.3.4). This proxy is applied for all individuals.

Based on the entitlement basis, the thresholds for additional earnings from employment are considered. For those individuals earning less than the threshold (165 Euro per month), the benefit amounts result from applying the respective benefit rate (60% for the childless and 67% for parents) to the entitlement basis. And, for those who earn more than the threshold, income exceeding the threshold is withdrawn. Finally, simulated benefit amounts are averaged per month, applying the simulated spell duration in months (*bunmy_s*).

2.5.3 Disability Pension from the Statutory Accident Insurance (*pdiss_de*)

Individuals insured in the statutory accident insurance – these are all employees – are eligible to disability pensions from the statutory accident insurance if consequences of an accident severely reduce their earnings capacity. Contributions are paid for by the employers.

- ***Definitions***

In case of a loss of the entire earnings capacity, a pension is paid that amounts to two thirds of annual individual earnings. This is assumed to be the case if individuals for whom benefit receipt is observed (*i_ntpy>0*) work zero hours per week (*lhw=0*). For those in receipt who work non-zero hours (*lhw>0*), the earnings capacity is assumed to be only partly reduced, according to the level of *lhw*. Unit of analysis is the individual.

- ***Eligibility Conditions***

Recipients should fulfil the following conditions: not to be civil servants, have some level of disability, and have some working history (*liwwh>0*). Moreover, they should have no receipt of unemployment benefit I (*bunct_s=0*), should be in receipt of any disability benefit (*pdi>0*) but not in receipt of pensions for reduced ability to work (*pdi00=0*). It is assumed that they suffer from reduced earnings capacity due to an accident if the above mentioned criteria are fulfilled. Conditioning on the working history (*liwwh>0*) is a proxy for eligibility to disability pensions. It is assumed that individuals who have ever worked before have been insured by the statutory accident insurance right before the spell started.

- ***Income Test***

Disability pensions are contributory benefits. There is no income or wealth test, in the sense of a means test, to receipt of these benefits.

- ***Benefit Amount***

The amount of disability pensions from the statutory accident insurance depends on the degree of reduction in ability to work. This degree of reduction shall be approximated by the number of weekly hours a recipient works, while in receipt. If this is zero hours (*lhw=0*) the earnings capacity is assumed to be reduced entirely and eligible individuals receive a full pension of 67% of their entire previous-year net employment income. If they work non-zero hours (*lhw>0)* the earnings capacity is assumed to be only partly reduced and a partly pension is paid in accordance to the remaining level of earnings capacity (factor of *1-lhw/30*). It is assumed that 30 hours and more (*lhw=>30)* is full-time work, which means that recipients working 30 hours or more per week are assumed to have unaffected earnings capacity and receive a pension of zero.

- ***EUROMOD modelling***

The main problem when simulating contributory disability benefits from the statutory accident insurance is that neither the contribution history, nor the entitlement basis that determines the benefit amount, nor the degree of disability, are observed in the data. While the contribution history and the disability level have been approximated with the help of other observed information, for the entitlement basis, more needs to be done. Pre-spell net employment income has been approximated by inverting the benefit function for several contributory benefits (*i_ntpy*, also see Section 3.3.4). Furthermore, in order to avoid double-counting of benefits, disability pensions from the accident insurance can only be simulated for individuals aged up to 65. The reason for this is that in the input dataset disability pensions from the accident insurance for individuals aged 65 and older are part of old-age benefits instead of disability benefits. The solution chosen to overcome this problem is that we use simulated disability benefits for individuals younger than 65 whereas we use observed disability benefits for those individuals older than 65.

2.5.4 Education Benefits (*bed_de*)

Education benefits are means-tested benefits for students entering higher education according to the German law for education, "*Bundesausbildungsförderungsgesetz* (*BaFöG)*".

- ***Definitions***

The means test refers to income and wealth of the students and in most cases also of their parents, as well as the number of students in the household who are eligible to education benefits. The unit of analysis thus is the individual as well as the household.

- ***Eligibility Conditions***

All students entering higher education before the age of 45 are generally eligible to education benefits.

- ***Income Test***

Education benefits are means-tested benefits. The benefit level depends on income and wealth of the recipient as well as on income of the recipient's spouse and in most cases also parents. Moreover, it depends on the presence of siblings in the household as well as their age and income. Parents' income is not taken into account for students older than 30 years old, for students that have worked at least 5 years after the age of 18 and for students that have worked for a certain amount of time after they received a professional qualification previous to the current education. The relevant income is generally the individual taxable income (*il_taxy*, added income from capital), added widows' and orphans' pensions, minus an allowance for social security contributions, minus actual taxes paid and minus an allowance for income-related expenses. The allowance for social security contributions differs depending on whether the contributor is compulsory insured by the pension insurance or not. For individuals with earnings from marginal employment, the allowance amounts to 37,7% for the years 2021 and 2022 and to 38% since August 2022 (simulated from 2023 on). For individuals that are insured by the statutory pension insurance, the allowance for them amounts to 21,3% for the years 2021 and 2022 and to 21.6% since August 2022 (simulated from 2023 on). Last, for pensioners the allowance amounts to 15,5% for the years 2021 and 2022 and to 15.9% since August 2022 (simulated from 2023 on). In all cases, these allowances are capped by a maximum amount, which is 8,500, 14,600 and 25,500 Euro for the years 2021 and 2022 and 9,000, 15,100 and 27,200 Euro since August 2022 (simulated from 2023 on). The allowance for income-related expenses corresponds to the allowance from personal income taxation (1,230 Euro per year, see Section 2.8.1).

There are moreover lump-sum allowances on own income and parents' income. If the parents of the recipient are married, the income allowance for them is up to 1,890 Euro in 2021, 2,000 Euro in 2022 and 2,415 Euro in 2023. For single parents, or parents married who live with a partner (not the mother or the father of the recipient), the allowance is 1,260 Euro in 2021, 1,330 Euro in 2022 and 1,605 Euro in 2023. Moreover, the amount of 555 Euro for 2020, 570 Euro for 2021, 605 Euro in 2022 and 730 Euro for 2023 and 2024 is added to the income allowance of the recipient's parents for each non-eligible sibling.

The student's own income allowance is 290 Euro per month for the years 2020-2022 and 330 for 2023 and 2024, plus 555 Euro for each own child in 2020, 570 Euro in 2021, 605 Euro in 2022 and 730 Euro in 2023 and 2024. These allowances reduce the relevant income of the recipients, their parents, and their partners. Incomes of parents and partners of married spouses, after accounting for all allowances, are considered at the benefit amount with 50% of the income only. The resulting relevant income is divided by the number of children eligible for education benefits.

In addition, there is a wealth test. Wealth holdings, after subtracting allowances, are generally subtracted from the benefit amount. The assets allowance for single students amounts to 7,500 Euro for the years 2017-2020 and 8,200 Euro for 2021 and 2022. Since 2023 the wealth allowance has been increased significantly to 15,000 Euro for individuals below the age of 30 and to 45,000 Euro for individuals aged 30 and older. For the spouse of a married student up to 2,300 Euro, plus 2,300 Euro for each own child of assets are not considered for the wealth test in 2023 and 2024.

- ***Benefit Amount***

The basic amount for university students who do not live with their parents is 744 Euro in 2020 and 752 Euro in 2021 and 2022 and 812 Euro in 2023 and 2024. This basic benefit rate is reduced if income exceeds the income thresholds (see Income Test). This basic rate includes allowances for housing expenses. The rate for housing expenses depends on the living conditions. Students living on their own get an increased rate of 325 Euro for the years 2020-2022 and 360 for the year 2023 and 2024. For non-university students living alone there are lower rates.

For recipients aged 25 and older, the basic rate is topped up by a lump-sum payment for health and long-term care insurance which sums up to 109 Euro per month for the years 2020-2022 and 122 Euro for the year 2023 and 2024.

High school students do not need to repay any of the benefits. However, university students get half of the benefits in form of an interest-free loan that has to be paid back under certain conditions after education is finished.

From 2009, there exists an add-on to the general benefit rate for students with children. If the recipient has an own child, aged younger than 10 years and living in the household of the student, the regular benefit rate is topped up by 113 Euro. From the second child on, aged younger than 10 years, the top up is increased by an additional 85 Euro. Since the year 2017 the benefit rate is topped up by 130 Euro for each own child under the age of 10 years. From August 1, 2019 on an add-on of 140 Euro is granted for children younger than 14 years, which is modelled from 2020 on. From 2023 on, the child supplement is 160 Euro.

- ***EUROMOD modelling***

Education benefits for students are granted for two groups of students in Germany. The first group still lives with their parents. For this group, the relevant information for determining eligibility is (partly) observed, or can be estimated, i.e. their parents' income and wealth. The second group of students does not live with their parents. The receipt of education benefits for students living without their parents has been conditioned on observed positive education benefits. For them, relevant information on income and wealth of their parents is not observed. This information,

however, is crucial for determining eligibility, as for many applicants, eligibility is rejected because their parents have income and/or wealth above the thresholds. Therefore, for those students for which we observe the receipt of education benefits in the data, income and wealth of their parents has been imputed. This is an imputation of a mean income. The imputed income is the mean after-SSC market income of married couples, aged between 46 and 59 (which is the mean age of parents with kids older than 18 +/- one SD), living in a two-person household, as observed in the EU-SILC micro data for Germany.

In the income test, also assets of the recipients and their parents are relevant. Imputed financial assets (*afc*) have been applied for this means test. The stock of assets that remains after applying all allowances has been averaged to a month (*afc*/12) in order to account for asset liquidations and make it comparable to monthly incomes. Housing expenditures have been accounted for at the means test (*xhcrt*, also see Section 3.3.5).

As explained above, all students entering university education before the age of 45 are eligible for education benefits. However, in EU-SILC data we do not observe when students have entered education. Therefore, eligibility is granted in terms of current age instead of age at the beginning of studies. Furthermore, education benefits are only paid for the regular number of semesters that a study programme is supposed to last. Given that we do not observe this information in EU-SILC data, EUROMOD ignores this eligibility criterion.

2.5.5 Long-Term Care Benefits from Statutory Accident Insurance (*pdiac_de*)

Starting from release H2.0+ onwards, this policy has been dropped. New information regarding the benefits included in EU-SILC has indicated that these benefits are not part of the input dataset.

2.5.6 Sickness Benefits (*bhl_de*)

Individuals insured by the statutory health insurance are entitled to sickness benefits (*Krankengeld der gesetzlichen Krankenversicherung*). Individuals privately insured can contribute to an additional insurance that entitles them to sickness benefits too (*private Pflegezusatz- und Krankentagegeldversicherung*).

- ***Definitions***

All individuals who are not civil servants are assumed to be insured either in the statutory or in a private health insurance, depending on their income. It is assumed that all individuals, for whom private insurance is simulated, also contribute to this additional health insurance. Civil servants are not entitled to these sickness benefits, as they are covered by a separate system (sickness benefits for civil servants are not simulated). Unit of analysis is the individual.

- ***Eligibility Conditions***

Individuals need to fulfil the status of sickness, which is checked for in the simulation by conditioning on the variable for economic status (*les=8*), i.e. individuals report being in the status "sick or disabled". They should not be civil servants, and they should be employed for less than 12 months during the observed year (*liwmy<12*), which is supposed to indicate that there is a relevant spell of sickness. They are further categorised in either statutory or private health insurance, in self-employed and not self-employed, and in employed or unemployed.

- ***Income Test***

Sickness benefits are contributory benefits. There is no income or wealth test, in the sense of a means test, to these benefits. However, assignment to statutory and to private health insurance is

determined by pre-spell after-social-contributions income from employment (*i_ntpy*, also see Section 3.3.4) and the threshold for statutory health insurance.

- ***Benefit Amount***

The benefit amount depends on the type of health insurance, statutory or private, and on the benefit entitlement basis, which is previous-year after-social-contributions income from employment. The minimum benefit rate for the statutory health insurance is 70% of the entitlement basis, and for the private health insurance it is 80%. This minimum rate applied to the benefit entitlement basis determines the benefit level.

The resulting benefit amount moreover differs for those employed and those unemployed. It is also different for the self-employed. Generally, the health insurance has to pay the employee share of social security contributions on the benefit amount. For those who are not self-employed, contributions to statutory pension insurance for employees (9.3% in 2021-2024), to long-term care insurance (1.525% in 2021-2023 and 1.7% in 2024), and to unemployment insurance (1.2% in 2021-2022 and 1.3% in 2023-2024) are paid and thereby reduce the benefit amount. For the self-employed, only contributions to statutory pension insurance are subtracted, however, the entire rate assuming the self-employed have to pay the employer's share as well (18.6% in 2021-2024). For the unemployed, the social security contributions are covered by the health insurance, and thus benefit amounts are not reduced.

- ***EUROMOD modelling***

Severity of the illness is not observed. Thus, for all entitled individuals only the minimum benefit level (70% for statutory health insurance and 80% for private health insurance) is assumed. The benefit entitlement basis is approximated differently for those employed and for those unemployed. For those employed, i.e. those who are not in receipt of unemployment benefits I (*bunct_s=0*), the general proxy for pre-spell income is applied (*i_ntpy*, also see Section 3.3.4). For those in receipt of unemployment benefits I (*bunct_s>0*), it is assumed that this is receipt equals the entitlement basis and it is applied to determine the benefit amount.

2.5.7 Citizen's benefit and Social Benefits (*bunnc_de and bsaot_de*)

Citizen's benefit are means-tested benefits to cover the needs of people who are not employed and not in receipt of contributory unemployment benefits (or whose contributory unemployment benefits do not entirely cover their basic needs). Up to the year 2022, social benefits were supposed to capture people who live together with recipients of citizen's benefit (then unemployment benefits II) but who are themselves not eligible to them, typically children, to cover their needs as well. Although, social benefits have been incorporated into citizen's benefits from 2023 on, both benefit components are still simulated separately for intertemporal comparisons.

- ***Definitions***

Citizen's benefit are means tested with respect to income and wealth. Means are determined by the needs of the "community" (*Bedarfsgemeinschaft*), which includes – if applicable – the partner (married or not, but living in the same household) and dependent children up to 25 years of age. This is the unit of analysis.

- ***Eligibility Conditions***

All individuals aged 15 or older, but younger than 65, who are able to work for at least three hours per day are eligible for citizen's benefit. Students eligible to education benefits and old-age pensioners are not eligible. Unemployment is no requirement for entitlement, and there is no

limitation for the hours worked. However, unemployment benefits I may be received at the same time. Dependent children need to be aged younger than 25, not be married and do not have earnings that cover their basic needs in order to be eligible to social benefits. They need to live in households receiving citizen's benefit.

- ***Income Test***

Citizen's benefits are means tested with respect to income and wealth of the unit of analysis. This means that the household's income and wealth are considered for the determination of needs, except for some allowances. This is usually done by a means test regarding income and wealth.

Relevant income: The income of the household that is relevant for the means test is disposable household income (*il_dispyc*), including market income from employment, pension income, most benefits (except for social assistance, housing benefits and additional child benefits), as well as social security contributions and income tax.[7]

Income allowances: there are allowances granted for earnings from employment. Benefits are unaffected by an additional (gross) employment income of 100 Euro per month. Until June 2023, employment income between 101 and 1000 Euro reduced benefits at a rate of 80%, income between 1000 Euro and 1,200 Euro at a rate of 90% (1,500 Euro for households with children). Above this level, earnings were deducted at 100%. From July 1st 2023, thresholds have been: employment income between 101 and 520 Euro reduces benefits at a rate of 80% and income between 521 Euro and 1000 Euro is reduced at a rate of 70%. Above 1000 Euro the calculation stays the same. This is modelled from 2024 on.

Wealth allowances: wealth allowances depend on the year of birth of each individual. From 2008 (incl) up to 2022, the wealth allowances deferred for four groups: those born before 1948, those born between 1948 and 1958, those born between 1958 and 1963, and those born after 1963. For each individual, a basic allowance of 750 Euro for claims from old-age provisions per year applied. For each life year, the wealth allowance increased by 520 Euro for those born before 1948 and 150 Euro for those born thereafter. However, this allowance was at minimum 3,100 Euro per year. The maximum amount the allowance could reach was 33,800 Euro for those born before 1948; 9,750 Euro for those born between 1948 and 1958; 9,900 Euro for those born between 1958 and 1963; and 10,050 Euro were granted for those born after 1963. The allowance for minors was 3,100 Euro. In addition, for every eligible member of the "community" (usually the household) there was an allowance of 750 Euro per person for basic purchases.

From 2023 on, wealth allowances´ changes and age differentiation are abolished. In general, wealth allowance now amounts to 15,000 Euro per person in the "community" and is also transferable among members. Furthermore, during the first year of benefit receipt the wealth allowance increases to 40,000 Euro for the recipient and 15,000 Euro for each additional member of the community.

If the wealth of the household is greater than the permitted allowances, then the household loses its entitlement to this benefit. The relevant income of the household minus the income allowances cannot exceed the overall benefit amount described below for the household to receive the benefit. If the relevant income minus the allowances is smaller than the overall benefit amount, then the benefit amounts to the difference between the two.

[7] Here, all benefits that are simulated earlier in the spine than citizen's benefit are applied in the simulated amount, while relevant benefits that are not simulated at all (*ils_pen, byr, ysv, bunot, buntr*), are applied in its observed amount.

- ***Benefit Amount***

The maximum benefit amount is made up of the basic benefit rates (which vary with age), actual housing and heating costs and, if applicable, health and long-term care social security contributions.

Table 2.4.8 Basic benefit rates (in Euro per month)

	2021	2022	2023	2024
Single Adult	446	449	502	563
Adult in a Couple (per Person)	401	404	451	506
Dependent child aged 0 to 5	283	285	318	357
Dependent child aged 6 to 13	309	311	348	390
Dependent child aged 14 to 17	373	376	420	471
Dependent child aged 18 to 25	357	360	402	451

In addition to the basic benefits, costs for actual housing and heating (as long as reasonable) are also covered.

This benefit also foresees benefits to cover additional needs of the household (*Mehrbedarfe*), which are granted in specific situations such as pregnancy, lone parenthood as well as disabilities and sicknesses. In EUROMOD, only benefits to cover additional needs because of lone parenthood are included (as there is no information on pregnancies and on medical and nutrition expenses incurred by people with disabilities or sicknesses which are not covered by the regular health and long-term care insurance). Additional benefits for lone parents amount from 12% to 60% of the single adult basic rate, depending on the number and ages of the dependent children living in the household. These rates have been constant over the years. Table 2.4.8.2 provides a summary of the benefit rules:

Table 2.4.8.2 Characteristics of the citizen's benefit

		since 2023
Eligibility	Contribution period	n/a
	Other conditions	Adults: aged 15+ and less than 65, able to work for at least 3 hours a day; children within the assessment unit: aged less than 25, not married and little/no earnings; assessment unit should fulfil an income and wealth test
	Eligibility of self-employed	The same as for employed
Payment	Contribution base	No contribution base. There is an income and wealth test. Income and wealth allowances are applied.
	Basic amount	Basic benefit rate (see Table 2.4.8)
	Additional amount	Costs for actual housing and heating are covered as well as additional needs of the household due to lone parenthood
	Floor	n/a
	Ceiling	Employment income between 101 and 520 Euro reduces benefits at a rate of 80%; between 520 and 1,000 Euro at a rate of 70%; above this level, at 100%
Duration	Standard (in months)	until eligibility no longer fulfilled
	Special cases (in month)	n/a
Subject to	Taxes	No
	SIC	No

- ***EUROMOD modelling***

As mentioned above, this benefit is meant to cover heating costs too. Given that we do not observe heating costs in the EUROMOD input database, we apply average heating costs by household size from the German Socio-Economic Panel.

Actual housing costs are covered by the benefit as long as they are reasonable. Given that housing costs vary a lot depending on the location of the flat, without further geographical information on where the household is located is not possible to apply a meaningful maximum. Therefore, in EUROMOD the totality of housing costs is covered for every recipient of this benefit.

We do not model if recipients are in the first year of benefit receipt such that we assume that wealth allowance amounts to 15,000 Euro per person in general.

Social benefits are still simulated separately (bsaot_de). To receive the total benefit amount of citizen's benefits for one household, one should calculate the sum of bunnc_de and bsaot_de.

BTA and BCA extensions are off for the bunnc_de policy, so the baseline model neither adjusts for non-take-up of the benefit nor calibrates its receipt, but the user can activate them if necessary. See section 2.4 for technical details on both extensions and their interactions.

Users can enable the necessary extensions in Country Tools/Set Switches. For proper functioning, the extensions require the following inputs:

- BTA: The estimated take-up rate of the benefit should be set as the value of the $bunnc_BTA_rate[8] constant in the model. Currently, the value is set to 1, indicating no adjustment for non-take-up.
- BCA: The aggregate expenditure needs to be filled out in the External Statistics table, so that the calibration rate ($bunnc_targetBCA_amt) is computed accordingly. Data are currently available for the years 2018-2023; given the absence of information for 2024, the calibration rate is not computed within the 2024 system, but the one computed within the 2023 system is used instead. For the modelling of reforms, the 2024 system should be used in order to allow for variation in the number of beneficiaries (hence expenditure): beneficiaries will change when the eligibility conditions change by applying the share of 2023 to the new pool of eligible units. If previous systems were used for reforms, total expenditure would remain constant irrespective of the reform applied, since the model would always stick to the existing external statistics.

2.5.8 Maternity Leave Benefits (*bmact_de*)

Maternity-leave benefits are contributory benefits paid for by the statutory health insurance system for six weeks before the child's birth and eight weeks thereafter in order to compensate foregone income from employment.

- ***Definitions***

This time frame of benefit receipt is called the time of maternity leave, where mothers are not allowed to work by law. Receipt is related to mothers, but eligibility is related to a baby in the household. Thus, the unit of analysis is sometimes the individual and sometimes the family.

[8] Estimation of non-take-up from external source: https://doku.iab.de/discussionpapers/2019/dp0619.pdf

- ***Eligibility Conditions***

All mothers who are employed and insured by the statutory health insurance, at the time when the time of maternity leave starts for them, are eligible to maternity-leave benefits. No contributions of a specific amount, or for a specific time, need to be made. The only differentiation that is made is between full-time and part-time employment.

- ***Income Test***

Maternity leave benefits are contributory benefits. There is no income or wealth test, in the sense of a means test, to these benefits. However, there is a differentiation made at the benefit amount between part-time and full-time employment. This is done applying a proxy for pre-spell income from employment (*i_ntpy*, also see Section 3.3.4).

- ***Benefit Amount***

The level of benefits amounts to a maximum of 13 Euro per day, which is 390 Euro per month. Benefits are reduced if employment was less than full time before the spell down to 210 Euro per month. These rates have been constant over the years 2020 to 2024. These amounts are multiplied by a factor of 3.5/12 when aggregating up to year to account for the fact that maternity leave benefits are only granted for a time of 3.5 months.

- ***Subject to taxes/SIC***

Exempt but enters the progressivity clause (i.e. it is itself not taxed away, but contributes to determining which tax rate is applied to the taxable income).

- ***Take up***

Almost 100%.

- ***EUROMOD modelling***

In the simulation, the identification of eligible mothers suffers from the problem that eligible mothers cannot easily be identified *before* they gave birth. Eligibility conditions on female gender (*dgn=0*), being a parent, not working (*liwmy=0*), and the presence of dependent children aged one year or younger in the family. By the latter condition, on the one hand eligible mothers that did not give birth to their first child yet are excluded, although they should be included. But, on the other hand mothers who are not eligible anymore because their giving birth is already more than eight weeks ago are included, although they should be excluded. This inevitable error made in the simulation needs to be kept in mind when comparing recipient rates and aggregate amounts to external statistics.

Also the employment level before the spell is not observed, but it can be approximated by months ever in work (*liwwh*), a proxy for pre-spell income (*i_ntpy*, also see Section 3.3.4), and current receipt of unemployment benefits I (*bunct_s*). Those who have either zero pre-spell income (*i_ntpy=0*), or zero months ever in work (*liwwh=0*), or receipt of unemployment benefits I (*bunct_s>0*) are assumed to have been unemployed before the spell. For them, benefits according to part-time employment are assigned. Those with some months ever in work (*liwwh>0*), no receipt of unemployment benefits (*bunct_s=0*), and some non-zero pre-spell income (*i_ntpy>0)*, are assumed to have been employed before the spell. If their pre-spell income exceeds the average employment income of women working 30 hours per week, as observed in the data, they are assumed to have been working full-time before the spell, and benefit amounts for full-time work are imputed. In case pre-spell income is lower, part-time work is assumed and benefit amounts follow accordingly.

Resulting benefits (*bmact_s*) are allocated to the mothers in the household. This must be consistent with the allocation of parental leave benefits (*bplct_de*), so that these benefits can be withdrawn from each other.

2.5.9 Parental Leave Benefits (*bplct_de*)

Parental-leave benefits (*Elterngeld)* were implemented in 2007 and substituted the formerly applied "*Erziehungsgeld*". While "*Erziehungsgeld*" was a lump-sum transfer, parental leave benefits are conditional on the previous labour earnings. They are non-means-tested benefits that replace a fraction of parents' foregone net labour earnings in case they suspend employment due to the birth of a child. The latest reform entered into force in July 2016 and allows parents the choice between the benefit the way it was defined up to then and the possibility to receive half the previous benefit but for a period twice as long (*Elterngeld Plus)*.

- ***Definitions***

Receipt can be related to mothers or to fathers because both are generally eligible to parental leave benefits. Eligibility is also related to a baby in the household. Thus, the unit of analysis is sometimes the individual, sometimes the couple of partners in the household and sometimes the family.

- ***Eligibility Conditions***

Parental-leave benefits are paid – in addition to child benefits – for a time frame of up to 12 months following the birth of the child. Benefit duration can be prolonged for another two months if parents share parental-leave time such that each of them suspends work for at least two months. Alternatively, to suspension, part-time work of up to 30 hours per week is allowed.

- ***Income Test***

There is no income or wealth test, in the sense of a means test, to these benefits. However, there is a threshold of taxable income of the relevant tax period before the birth of the child above which parents do not receive any parental benefits. Until 31st of March 2024 this threshold amounted to 300,000 Euro per year for couples and 250,000 Euro per year for lone parents. From April 2024 onwards, the income threshold is lowered to 175,000 Euro per year for both, couples and lone parents.

- ***Benefit Amount***

The minimum level of parental-leave benefits is 300 Euro per month, which is paid in case the recipient was unemployed before the child's birth or net income was below 300 Euro. The maximum benefit level is 1,800 Euro per month, which is paid if net income was 2,770 Euro or more. In between, benefits generally amount to 65% of net income, considerably more for low income and slightly less for high incomes. These rates have been constant over the years 2021 to 2024. (When someone was in "Kurzarbeit" due to COVID-19, this will not be taken into account).

- ***Subject to taxes/SIC***

Exempt from both SIC and taxes but enters the progressivity clause (i.e. it is itself not taxed away, but contributes to determining which tax rate is applied to the taxable income).

- ***Take up***

Very high (almost 100%, no concrete figures available).

- ***EUROMOD modelling***

Eligibility is conditioned in the simulation on number of months in work during the observed year to be less than 12 (*liwmy<12*). Thereby an error is inevitable, because it is not reported which part of these months out of work actually belong to a spell of parental-leave benefit receipt.

Moreover, it is not observed who of the two parents is currently in receipt of benefits, the mother, or the father, even in case a receipt of the couple if observed. Therefore, the simulation differentiates between the cases that the mother works more hours than the father and the opposite situation. It is accounted for the fact that the mother is in receipt of parental-leave benefits for some months in any case, whereas the father can opt to take the father months or not. It is assumed that in case the mother is observed working more hours (*lhw*), than the father takes some of the father months so that the average joint income of the spouses is the relevant income for benefit entitlement. However, in case the father works more hours, which is the dominant case in the data, it is assumed that the mother is in parental leave most time of the year so that only her income determines the amount of parental leave benefits. The respective relevant pre-spell income is determined by the general proxy for pre-spell income for contributory benefits (*i_ntpy*, also see Section 3.3.4).

Mothers working zero hours (*lhw=0*) with a pre-spell income below 300 Euro per month get a minimum benefit amount of 300 Euro per month assigned, while those with pre-spell income above 300 Euro get the regular rate of 67% of their pre-spell income if it is greater than the minimum amount, but at maximum they get the maximum amount of 1,800 Euro. In any case, maternity-leave benefits received are deducted from parental-leave benefits.

Mothers working non-zero hours (*lhw>0*), but less than the maximum allowed number of hours (*lhw<=30*), get benefits assigned according to their pre-spell income. The standard rate is applied (67%), within the range of minimum and maximum benefit amounts, and maternity-leave benefits received are deducted.

If mothers work more than the maximum hours allowed (*lhw>30*), but the fathers work less than maximum, benefits are assigned to the fathers. The pre-spell income of the fathers is relevant in this case. Benefit amounts are assigned accordingly, within minimum and maximum range, and maternity benefits are accounted for.

Generally, parental-leave benefits are simulated after maternity-leave benefits in the EUROMOD spine, in order to account for the fact that maternity-leave benefits are deducted from parental-leave benefits in case of receipt for both.

Elterngeld Plus is not simulated as there is no information in the data whether people opt for this option.

2.5.10 Housing benefits *(bho00_de)*

- ***Definitions***

Housing benefits (Wohngeld) provide financial help for covering part of the costs of accommodation and are means-tested.

- ***Eligibility Conditions***

Eligibility is based on household income. Additionally, recipients of citizen's benefit (*bunnc_s*), old-age social assistance (*bsaoa_s*) and basic social assistance (*bsa00_s*) cannot receive housing benefits (and vice versa). Some individuals may qualify for both benefits, in which case they have to decide for one of them.

- ***Income Test***

The relevant income for receiving housing benefits (Y in the formula below) is made up of all sources of gross income (including contributive benefits) with some deductions dependent on whether paying contributions and/or income tax. The deduction amounts to 10% if either health and long-term care insurance contributions, or pension insurance contributions, or income taxes are paid. The deduction amounts to 20% for those individuals that pay health, long-term care and pension contributions, or for those that pay income taxes plus some kind of social security contributions. Finally, the deduction is 30% for those individuals that pay both taxes and all three kinds of social security contributions. Furthermore, the following quantities can be deducted in three cases: (1) 1,800 Euro per year for each disabled person living in the household that has either the maximum degree of disability or is in need of home or inpatient care, (2) 1,320 Euro per year per lone parent household, (3) at maximum 1,200 Euro per year per child under the age of 25 with own income.

- ***Benefit Amount***

The monthly benefit amount (in Euro) is calculated through the following formula: 1.15*[M-(a+b*M + c*Y)*Y], where M stands for the relevant housing rent, Y for the relevant income, and a, b, and c are parameters that vary according to household size. The parameters a, b and c have been updated in 2023.

The relevant housing rent, M, is computed as the actual rent as long as it does not exceed a maximum determined by law, which varies across municipalities. These maximum amounts were increased in 2023 due to the introduction of a new heating cost component as well as a climate component and remain constant in 2024. The heating cost component should compensate for actual heating costs as well as increases in the price for CO2 emissions.

If the formula above yields less than 10 Euro per month, no housing benefits are paid.

- ***EUROMOD modelling***

The housing benefits law defines seven possible categories of rent prices from 2020 on. Each municipality determines which category reflects its rent prices. Due to missing detailed regional information in SILC, the model assumes that the maximum rent eligible to be financially supported by the housing benefits is that of the median price category.

In order to grant the deduction in the case of disability, the model requires a disability of minimum 80%. This is meant to account for the formulation used in the law “highest degree of disability or in need of home or inpatient care”.

Both housing benefits (*bho00_s*) and additional child benefits (*bchot_s*) cannot be received simultaneously with either citizen’s benefit (*bunnc_s*), old-age social assistance (*bsaoa_s*) or basic social assistance (*bsa00_s*). However, some individuals – especially those with own low market earnings and/or with children – may qualify for both, in which case the model assumes individuals decide for the alternative that yield the highest financial help. This correction is carried out at the end of the additional child benefits policy, *bchot_de*.

BTA and BCA extensions are off, so the baseline model neither adjusts for non-take-up of the benefit nor calibrates its receipt, but the user can activate them if necessary. See section 2.4 for technical details on both extensions and their interactions.

Users can enable the necessary extensions in Country Tools/Set Switches. For proper functioning, the extensions require the following inputs:

- BTA: The estimated take-up rate of the benefit should be set as the value of the $bho00_BTA_rate[9] constant in the model. Currently, the value is set to 1, indicating no adjustment for non-take-up.
- BCA: The aggregate expenditure needs to be filled out in the External Statistics table, so that the calibration rate ($bho00_targetBCA_amt) is computed accordingly. Data are currently available for the years 2018-2023; given the absence of information for 2024, the calibration rate is not computed within the 2024 system, but the one computed within the 2023 system is used instead. For the modelling of reforms, the 2024 system should be used in order to allow for variation in the number of beneficiaries (hence expenditure): beneficiaries will change when the eligibility conditions change by applying the share of 2023 to the new pool of eligible units. If previous systems were used for reforms, total expenditure would remain constant irrespective of the reform applied, since the model would always stick to the existing external statistics.

2.5.11 Social Assistance for Old-age and for Reduced Work Ability (*bsaoa_de*)

Social assistance for old-age and for reduced ability to work ensures the basic needs for living for older people and for those individuals who are permanently fully incapacitated for work. This benefit is closely related to citizen's benefit – as the benefit amounts are identical under both regimes – but eligibility criteria and income test are stricter under social assistance.

- ***Definitions***

Old-age social assistance and social assistance for reduced work cover individuals who are not eligible to citizen's benefit because they are not able to work at least three hours per day. The unit of analysis is the concept of "community" (*Bedarfsgemeinschaft*) used for citizen's benefit (*bunnc_de*).

- ***Eligibility Conditions***

Old-age social assistance: Individuals should have either 65 years of age or more, or they should be 18 years or older and permanently unable to work at least three hours per day to be eligible to old-age social assistance or social assistance for reduced work. Generally, recipients cannot receive income from citizen's benefit. Thus, eligibility is conditioned on not receiving citizen's benefit (*bunnc_s=0).*

Social assistance for reduced ability to work: Individuals need to be at least 18 but not older than 65 and be disabled and not working *(lhw=0 & liwmy=0*).

- ***Income Test***

There is a means test on income and wealth for eligibility to old-age social assistance and social assistance for reduced work ability. There are allowances for income and wealth, which depend on household composition and the age of household members and are detailed below.

Relevant income: Disposable income (including market income from employment, pension income, most benefits and accounting for social security contributions and income tax), excluding citizen's benefit, additional child benefit, housing benefits and disability benefits for war victims.

[9] Estimation of non-take-up from external source: https://econpapers.repec.org/article/palcompes/v_3a60_3ay_3a2018_3ai_3a4_3ad_3a10.1057_5fs41294-017-0041-5.htm

Income allowances: 30% on earned income, up to 50% of the basic benefit rate (see benefit amount below).

Wealth allowances: From 2017 onwards, the wealth allowance has been raised to 5000 Euro per adult in the household and 500 Euro per child (irrespective of their ages).

If the wealth of the household is greater than the permitted allowances, then the household loses its entitlement to this benefit. The relevant income of the household minus the income allowances cannot exceed the overall benefit amount described below in order for the household to receive the benefit. If the relevant income minus the allowances is smaller than the overall benefit amount, then the benefit amounts to the difference between the two.

- ***Benefit Amount***

Benefit amounts are exactly the same as under Citizen's benefit (see Section 2.5.7.).

The maximum benefit amount is made up of the basic benefit rates (which vary with age), actual housing and heating costs and, if applicable, health and long-term care social security contributions.

Table 2.4 Basic benefit rates (in Euro per month)

	2021	2022	2023	2024
Single adult	446	449	502	563
Adult in a couple (per person)	401	404	451	506

In addition to the basic benefits, costs for actual housing and heating (as long as reasonable) are also covered.

This benefit also foresees benefits to cover additional needs of the household (*Mehrbedarfe*), which are granted in specific situations such as pregnancy, lone parenthood as well as disabilities and sicknesses. In EUROMOD, only benefits to cover additional needs because of lone parenthood are included (as there is no information on pregnancies and on medical and nutrition expenses incurred by people with disabilities or sicknesses which are not covered by the regular health and long-term care insurance). Additional benefits for lone parents amount from 12% to 60% of the single adult basic rate, depending on the number and ages of the dependent children living in the household. These rates have been constant over the years.

- ***EUROMOD modelling***

As mentioned above, this benefit is meant to cover heating costs too. Given that we do not observe heating costs in the EUROMOD input database, we apply average heating costs by household size from the German Socio-Economic Panel.

Actual housing costs are covered by the benefit as long as they are reasonable. Given that housing costs vary a lot depending on the location of the flat, without further geographical information on where the household is located is not possible to apply a meaningful maximum. Therefore, in EUROMOD the totality of housing costs is covered for every recipient of this benefit.

2.5.12 General Social Assistance (*bsa00_de*)

Individuals who are not able to work at least three hours per day – either because they are aged 65 or older, or because they are aged 18-65 and physically not able to work, and who are not covered by social assistance for old-age and reduced work ability, are entitled to general social assistance. This shall secure a minimum income for everybody. Income test and benefit amounts are exactly the same as under social assistance for old-age and for reduced ability, only the eligibility conditions differ.

- ***Definitions***

These benefits are means tested with respect to income and wealth and they are determined by the needs of the entire household. Thus, unit of analysis is the household.

- ***Eligibility Conditions***

Recipients of general social assistance need to be unable to work at least three hours per day. Recipients need to be aged between 18 and 65, and they cannot receive income from any of the following benefits: education benefits (*bed_s=0*), citizen's benefit (*bunnc_s=0*), and social assistance for old-age and reduced work ability (*bsaoa_s=0*).

- ***Income Test***

There is a means test on income and wealth for eligibility to old-age social assistance and social assistance for reduced work ability. There are allowances for income and wealth, which depend on household composition and the age of household members and are detailed below.

Relevant income: Disposable income (including market income from employment, pension income, most benefits and accounting for social security contributions and income tax), excluding citizen's benefit, additional child benefit, housing benefits and disability benefits for war victims.

Income allowances: 30% on earned income, up to 50% of the basic benefit rate (see benefit amount below).

Wealth allowances: From 2017 onwards, the wealth allowance has been raised to 5000 Euro per adult in the household and 500 Euro per child (irrespective of their ages).

If the wealth of the household is greater than the permitted allowances, then the household loses its entitlement to this benefit. The relevant income of the household minus the income allowances cannot exceed the overall benefit amount described below in order for the household to receive the benefit. If the relevant incomes minus the allowances are smaller than the overall benefit amount, then the benefit amounts to the difference between the two.

- ***Benefit Amount***

Benefit amounts are exactly the same as under Citizen's benefit (see Section 2.5.7.).

The maximum benefit amount is made up of the basic benefit rates (which vary with age), actual housing and heating costs and, if applicable, health and long-term care social security contributions.

Table 2.5 Basic benefit rates (in Euro per month)

	2021	2022	2023	2024
Single adult	446	449	502	563
Adult in a couple (per person)	401	404	451	506
Dependent child aged 0 to 5	283	285	318	357
Dependent child aged 6 to 13	309	311	348	390
Dependent child aged 14 to 17	373	376	420	471
Dependent child aged 18 to 25	357	360	402	451

In addition to the basic benefits, costs for actual housing and heating (as long as reasonable) are also covered.

This benefit also foresees benefits to cover additional needs of the household (*Mehrbedarfe*), which are granted in specific situations such as pregnancy, lone parenthood as well as disabilities and sicknesses. In EUROMOD, only benefits to cover additional needs because of lone parenthood are included (as there is no information on pregnancies and on medical and nutrition expenses incurred by people with disabilities or sicknesses which are not covered by the regular health and long-term care insurance). Additional benefits for lone parents amount from 12% to 60% of the single adult basic rate, depending on the number and ages of the dependent children living in the household. These rates have been constant over the years.

- ***EUROMOD modelling***

As mentioned above, this benefit is meant to cover heating costs too. Given that we do not observe heating costs in the EUROMOD input database, we apply average heating costs by household size from the German Socio-Economic Panel.

Actual housing costs are covered by the benefit as long as they are reasonable. Given that housing costs vary a lot depending on the location of the flat, without further geographical information on where the household is located is not possible to apply a meaningful maximum. Therefore, in EUROMOD the totality of housing costs is covered for every recipient of this benefit.

2.5.13 Additional Child Benefits (*bchot_de*)

Additional child benefits are social benefits that are supposed to help families, in which parents receive income and child benefits covering their own needs according to "citizen's benefit", but not the needs of the dependent children entirely (*Kinderzuschlag*).

- ***Definitions***

The unit of analysis is the family, as defined under the simulation of child benefits.

- ***Eligibility Conditions***

To be eligible, dependent children need to be eligible to child benefits (*bch00_s>0*), be aged 25 or younger, and in addition be unmarried and live in the same household with their parents. Note how this condition varies from the eligibility condition at child benefits, where dependent children may live in an own household.

- ***Income Test***

The level of the additional child benefits depends on the children's needs and the household's income and wealth. It is reduced if household income exceeds the parents' needs, or if the household holds wealth exceeding an allowance.

There is an income test on eligibility. Disposable household income needs to fall between two thresholds, such that households fulfil minimum income requirements, but do not exceed a maximum level. Generally, income must cover the parents' needs, but not the needs of the children, so that households receiving only general social assistance, or citizen's benefit are usually not eligible for the additional child benefits. For each euro of income above the previous maximum amount, the additional child benefits are lowered by 0.45 Euro

For the period 2021-2024, the lower income threshold of the income test is a lump-sum amount of 600 Euro per lone parent and 900 Euro per couple. As mentioned before, with additional income above the upper threshold the additional child benefits will be reduced gradually. The respective upper limit is the amount equivalent to the basic benefits of the parents under Citizen's benefit plus the number of children multiplied by the maximum benefit amount (205 Euro per month for 2021, 209 Euro for 2022, 250 Euro for 2023, 292 Euro for 2024). Each of the lower and upper limits is topped up by an additional allowance for housing expenses. These are based on the actual rent paid (*xhcrt*) multiplied by a factor lower than one, which varies by number of children and whether it is a lone/couple parent household.

Table 2.6 reports these coefficients.

Table 2.6 Proportion of housing expenses which are deemed to cover parents' needs in 2021-2024 (BMFSFJ 2024)

Number of children	Lone parent	Couple parents
1	0.77	0.83
2	0.63	0.71
3	0.53	0.62
4	0.46	0.55
5 or more	0.40	0.50

The income of the household that needs to fall within in the lower and upper limits is disposable household income, after social contributions and including simulated benefits, but before income taxes. It explicitly excludes child benefits, housing benefits, maternity-leave benefits, and parental-leave benefits.

- ***Benefit Amount***

Maximum benefits amounted to 205 Euro per month in 2021 and 209 Euro per months for the first half 2022, which was topped up by 20 Euro from 01.07.2022. In 2023 the maximum benefit amounted to 250 Euro and in 2024 is 292 Euro per month per child. It is paid if households pass the income test. It is reduced by the family's income as far as it exceeds the lower threshold for benefit eligibility, by a fraction of 45% since 2020. It is further reduced by children's own income, market or replacement income, and if households hold wealth exceeding certain allowances, which are the same as for general social assistance. Starting from 2020 the additional child benefit is not dropped entirely when the income reaches an upper threshold, instead it is further reduced by a fraction of 45% of the family's income until it equals zero.

- ***EUROMOD modelling***

When benefit amounts are simulated, receipt is conditioned on receipt of child benefits (*bch00_s>0*), and on the relevant household income falling within the relevant income range. In case this income test is passed, the basic benefit rate is assigned for each dependent child in the household. Relevant assets, after accounting for allowances, and averaged per month, are subtracted from benefit amounts.

In addition, the simulation of this policy includes an adjustment mechanism that checks whether households are better off receiving any combination of *bunnc_s*, *bsaoa_s* or *bsa00_s* or receiving any combination of *bho00_s* and *bchot_s*. Households within a determined income range – usually households with children – may qualify for both kinds of state assistance but necessarily need to choose one. The program here assumes that households do choose the option that yields the highest financial gain and sets the benefit amount of the other option to zero. In reality, households that do qualify for both systems are free to choose the system they like the most (for instance, in terms of reporting requirements) and might not choose the best financial option.

BTA and BCA extensions are off, so the baseline model neither adjusts for non-take-up of the benefit nor calibrates its receipt, but the user can activate them if necessary. See section 2.4 for technical details on both extensions and their interactions.

Users can enable the necessary extensions in Country Tools/Set Switches. For proper functioning, the extensions require the following inputs:

- BTA: The estimated take-up rate of the benefit should be set as the value of the $bchot_BTA_rate[10] constant in the model. Currently, the value is set to 1, indicating no adjustment for non-take-up.
- BCA: The aggregate expenditure needs to be filled out in the External Statistics table, so that the calibration rate $bchot_targetBCA_amt) is computed accordingly. Data are currently available for the years 2018-2023; given the absence of information for 2024, the calibration rate is not computed within the 2024 system, but the one computed within the 2023 system is used instead. For the modelling of reforms, the 2024 system should be used in order to allow for variation in the number of beneficiaries (hence expenditure): beneficiaries will change when the eligibility conditions change by applying the share of 2023 to the new pool of eligible units. If previous systems were used for reforms, total expenditure would remain constant irrespective of the reform applied, since the model would always stick to the existing external statistics.

2.5.14 Educational Allowance for School Material (*bched_de*)

- ***Definitions***

The educational allowance for school material is part of a broader category of benefits (the so-called *Bildungs- und Teilhabepaket*) which aim at improving the educational and cultural chances of children living in households who receive means-tested benefits. Most of these benefits are in-kind benefits, which are not simulated in EUROMOD.

[10] Estimation of non-take-up from external source: https://econpapers.repec.org/article/palcompes/v_3a60_3ay_3a2018_3ai_3a4_3ad_3a10.1057_5fs41294-017-0041-5.htm

- ***Eligibility Conditions***

All children in school age living in households who receive any of the following means-tested benefits: bunnc, bsaot, bsa00, bsaoa, bho00, bchot.

- ***Income Test***

None, but eligibility depends on the household receiving means-tested benefits.

- ***Benefit Amount***

From 2021 on, the benefit amount is increased by the same rates the basic benefit rates of unemployment benefit II increase, such that in 2022 the benefits amount to 156 Euro. With the introduction of citizen's benefit in 2023, the benefit increased again to 174 Euro and in 2024 it increased accordingly to 195 Euro per year.

- ***EUROMOD modelling***

As only children living in households receiving the aforementioned benefits are eligible, the simulation of the allowance for school material is dependent on the simulation of these benefits and thus no separate or additional eligibility condition is implemented in EUROMOD.

2.5.15 Wage Compensation Scheme (bwkmcee_de)

- ***Definitions***

The wage compensation scheme (Kurzarbeitergeld) compensates wage losses from unvoluntary reduced work hours. It is a contributory benefit from the social security unemployment insurance. This benefit is paid for a maximum of 12 months.

- ***Eligibility Conditions***

All dependent employees with earnings above the minijob threshold whose employers apply for reduced work hours.

- ***Income Test***

None.

- ***Benefit Amount***

In principle, the benefit amount is 60% of the difference in net earnings (gross earnings minus taxes and social security contributions). For individuals with children, the benefit amount is 67%.

Due to the corona crisis in 2020, the replacement rate has been increased for individuals who receive wage compensation for more than 4 months, provided that the hours reduction is at least 50% of their original work hours. Thus, the replacement rate amounts to 70% in the fifth and sixth months (77% for parents) and to 80% from the seventh month onwards (87% for parents). This regulation remained in force during 2021 and up to 30th of June, 2022.

- ***EUROMOD modelling***

Given that the benefit replaces the difference in net earnings, policy "bwkmcee_de" computes net earnings under the observed earnings and under the simulated reduced hours. To this end, Euromod uses a simplified tax tariff and SSC computations (which is how state agencies compute the benefit amount).

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 monetary compensation schemes are defined in the TransLMA_de 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.

2.6 Extraordinary measures

2.6.1 Covid-related one-off child bonus (bencovidch_de)

- ***Definitions***

The child bonus is a one-off benefit paid to families with children as family-oriented support during the COVID19 pandemic. In 2022 the bonus was continued (*Kinderbonus 2022)*. No one-off payment is in place in 2023.

- ***Eligibility Conditions***

All children eligible for child benefits (bch00_s) are eligible for this benefit.

- ***Income Test***

None. However, in contrast to the usual child benefits (bch00_s), the child bonus is not deducted from any means-tested benefits.

- ***Benefit Amount***

This benefit amounts to one-off 300 Euro per child in 2020, 150 Euro in 2021 and 100 Euro per child in 2022.

- ***EUROMOD modelling***

This benefit is saved in variable bchls_s.

2.6.2 Covid-related one-off benefit for the self-employed (bencovidse_de)

- ***Definitions***

Due to the lock-down at the beginning of the Covid pandemic in 2020, the government provided a one-off payment aimed to help self-employed to pay for current expenses during the lock-down and, therefore, compensating parts of operating losses. This payment does not need to be paid back to the government.

- ***Eligibility Conditions***

Self-employed individuals with firms up to 10 employees can apply for this payment.

- ***Income Test***

None. However, self-employed individuals need to assure/submit proof of being in severe financial distress as a consequence of the lockdown.

- ***Benefit Amount***

Individuals can apply for a maximum of 9,000 Euro in firms up to 5 employees and for a maximum of 15,000 Euro in firms up to 10 employees.

- ***EUROMOD modelling***

Given that we do not have information on the individual amount of operating losses, i.e. the decrease in self-employment income, the benefit is turn off by default. In case this benefit is turned on, a random variable determines whether a self-employed individual applies for this funding. This benefit is then saved in variable bwkmcse_s. For individuals applying for this benefit, their income is reduced downwards in policy "yseadj_de". In case, the policy is switched on, it is only useful in combination with data before the COVID crisis.

2.6.3 Heating bonus (bhtxp_de)

- ***Definitions***

In spring 2022, the German government introduced a one-off payment for households with lower income to compensate for increasing energy costs (*Heizkostenzuschuss*). The benefit was not considered for income test for other social benefits. In September 2022, a second heating bonus was introduced, that was paid during 2023.

- ***Eligibility Conditions***

For the first heating bonus, every person that received housing benefits or education benefits between October 2021 and March 2022 for at least one month is eligible for the benefit. For the second heating bonus, every person that received housing benefits or education benefits between September 2022 and December 2022 for at least one month is eligible for the benefit.

- ***Income Test***

There is no separate or additional income test for the heating bonus. For the income tests for housing benefits and education benefits, see the respective paragraphs.

- ***Benefit Amount***

The benefit is different between recipients of housing benefits and recipients of education benefits. For a single household that receives housing benefits the first heating bonus amounts to 270 Euro, for a household with two household members 350 Euro are paid and for each additional household member the benefit amounts to 70 Euro. In case of the second heating bonus, single households receive 415 Euro, two-person households receive 510 Euro and for each additional household member 100 Euro are added.

Recipients of education benefits are paid 230 Euro and 345 Euro.

- ***EUROMOD modelling***

Eligibility is assessed by using the information from the input data on actual receipt of housing benefits (bho00_de) and education benefits (bed_de). We assume that if individuals indicated the receipt of housing and education benefits during the time of the interviews, they also received them during the evaluation period. In case of the second heating bonus, that was paid during 2023, eligibility is based on benefit receipt during a period of 2022. As the two evaluation periods for the first and second payment do not lie substantially far apart from each other, we assume that receipt did not change between these two periods.

2.6.4 Lump-sum energy transfer (blsxp_de)

- ***Definitions***

In spring 2022, the German government introduced a lump-sum one-off payment due to increasing energy prices. Every employee and self-employed whose labor income is subject to income taxation received the benefit by September 1st, 2022. Employees were paid directly by their employer, while self-employed paid less advance tax on their expected income. In addition to that, also pensioners received a lump-sum one-off payment in December 2022.

- ***Eligibility Conditions***

Every individual who receives labor income that is subject to income taxation and individuals working in a minijob, as long as their employee pays the lump-sum income tax for minijobs, receive the benefit.

- ***Income Test***

No income test is conducted.

- ***Benefit Amount***

The gross benefit amounts to 300 Euro per recipient. As the benefit is subject to income taxation the net benefit will be lower in most of the cases except for individuals working in a minijob. The range of the net benefit is therefore 300 Euro (minijob) to 165 Euro (highest income tax tariff bracket).

- ***EUROMOD modelling***

In practice, all individuals with labour income subject to income taxation that were employed on September 1st, 2022 received the benefit. In EUROMOD, all employees that have earnings above the minijob threshold (450 Euro for 2022) and are not listed as currently unemployed are assumed to receive the benefit. In case of self-employment, we do not have any information of advance tax payments of the individuals. We thus assume that self-employed receive the lump-sum energy transfer as the regular employed. As only individuals that have income subject to income taxation were eligible for the benefit, self-employment income must exceed the basic tax-free allowance. This is considered in the simulation.

Note that in this policy only the gross benefit of 300 Euro is simulated. To account for income taxation, the lump-sum energy transfer is added to taxable income.

2.6.5 One-off payments for unemployed and recipients of social assistance (bsaxp_de)

- ***Definitions***

In spring 2022, the German government introduced one-off payments for various recipients of social benefits, mainly unemployment benefits and social assistance, to support low-income households in dealing with increasing energy prices. One-off payment was in place only in 2022.

- ***Eligibility Conditions***

Every individual who is eligible for unemployment benefits I and II, general social assistance and social assistance for old-age and reduced work ability is automatically eligible for the one-off payments.

- ***Income Test***

There is no separate or additional income test for the one-off payments. For the income tests for citizen's benefit, general social assistance and social assistance for old-age and reduced work ability, see the respective paragraphs.

- ***Benefit Amount***

Recipients of citizen's benefit, general social assistance and social assistance for old-age and reduced work ability receive a one-off payment of 200 Euro, while recipients of unemployment benefits I receive 100 Euro.

- ***EUROMOD modelling***

Eligibility conditions from the relevant policies (bunnc_s, bsaot_s, bsaoa_s, bsa00_s, bunct_s) are used to assess eligibility for the benefit.

2.6.6 Lump-sum energy transfer for students (blsxpsd_de)

- ***Definitions***

In March 2023, university students and students in other tertiary education could receive an energy-related one-off payment after filing an application. In contrast to the benefit for working individuals and pensioners, the payment for students was tax exempt. The payment was in place only in 2023.

- ***Eligibility Conditions***

To receive the benefit, students need to be enrolled at a university or other tertiary educational institution by December 1st, 2022. It is also possible to receive the lump-sum energy transfer for students and *blsxp_s* at the same time, if students fulfill the respective criteria (see 2.6.4).

- ***Income Test***

No income test is conducted.

- ***Benefit amount***

The benefit amounts to 200 Euro per student. The payment is tax and social security contribution exempt.

- ***EUROMOD Modelling***

Eligibility is assessed according to the current status of education as observed in the data assuming implicitly that the status of education coincides to the one on December 1st, 2022. Although it might be the special case that some students in tertiary education are not eligible for the benefit, e.g. some vocational schools, we assume that all students currently enrolled in tertiary education are eligible for the benefit. Furthermore, we assume full-take up for the benefit.

2.7 Social insurance contributions

Generally, social contributions to all insurance systems have been simulated for most of the social groups. The relevant contribution rates for the single insurance systems are tabulated in Tables 2.7 to 2.13.

In Table 2.7, the entire contribution rates are displayed. These are, however, often shared between employers and employees. Therefore, subsequent tables show contribution rates to the respective system, differentiated by the single social groups.

Table 2.7 Social Security: contribution rates[1] and assessment ceilings

	2021	2022	2023	2024
Statutory pension insurance (*gesetzliche Rentenversicherung*)				
Contribution rate	18.6	18.6	18.6	18.6
Assessment ceiling (western Germany), Euro per month	7,100	7,050	7,300	7,550
Assessment ceiling (eastern Germany), Euro per month	6,700	6,750	7,100	7,450
Average Assessment ceiling [2]	7,022	6,992	7,261	7,531
Statutory health insurance (*gesetzliche Krankenversicherung*)				
Contribution rate[3]	15.9	15.9	16.2	16.3
Assessment ceiling, Euro per month	4,837.5	4,837.5	4,987.5	5,175
Threshold for compulsory insurance, Euro per month (*Versicherungspflichtgrenze*)	5,362.5	5,362.5	5,550	5,775
Statutory long-term care insurance (*soziale Pflegeversicherung*) [4]	3.05	3.05	3.05	3.40
Employees w/o children (additionally)	0.25	0.35	0.35	0.60
Saxony (additionally for employees, in exchange for one more holiday)	0.50	0.50	0.50	0.50
Reduction per child from two to five or more children below 25 years	0.00	0.00	0.00	0.25
Statutory unemployment insurance (*ges. Arbeitslosenversicherung*)	2.40	2.40	2.60	2.60
Statutory accident insurance (*gesetzliche Unfallversicherung*)	0.96	1.12	1.12	1.12

Notes: [1] Contribution rates refer to the entire rate paid, i.e. the rate paid for by the employer, plus the rate paid for by the employee. [2] Weighted average with the census population shares. The assessment ceiling applies also to the unemployment insurance. [3] From 2015, average additional rates have been assumed (these amount 1.3% in 2021 and 2022, 1.6% in 2023 and 1.7% in 2024). [4] Basic contribution rate increased to 3.4% and additional rate to 0.6% already by July 1st, 2023. The assessment ceiling and threshold for compulsory insurance of the long-term care insurance corresponds to the one of statutory health insurance

Table 2.8 shows contribution rates to the statutory pension insurance over the years 2021 to 2024, differentiated by contribution rates for employers (for regular employment and for minijobs), employees, the self-employed, and pensioners.

Table 2.8 Social contributions: Statutory Pension Insurance (rates in %)

	2021	2022	2023	2024
Employer Contribution Rate				
Regular Employment (and Midijobs)	9.30	9.30	9.30	9.30
...Minijobs	15.00	15.00	15.00	15.00
Employee Contribution Rate	9.30	9.30	9.30	9.30
Self-employed (in certain services) Contribution Rate[1]	18.60	18.60	18.60	18.60
Pensioner Contribution Rate	0.00	0.00	0.00	0.00

Notes: [1] This is the contribution rate to statutory pension insurance that has been assumed in the simulation for the self-employed in health and education services.

Table 2.9 shows contribution rates to the statutory health insurance over the years 2021 to 2024, differentiated by contribution rates for employers (for regular employment and for minijobs), employees, the self-employed, and pensioners. Starting from 2015 onwards, public health insurance companies (*gesetzliche Krankenkassen*) can set company-specific additional contributions. Since 2019 these additional contributions are paid equally by the employer and the employee. EUROMOD assumes for each year the average additional contribution as published by the German government. These amount to 1.3% in 2021 and 2022,1.6% in 2023 and 1.7 % in 2024.

Table 2.9 Social contributions: Statutory Health Insurance (rates in %)

	2021	2022	2023	2024
Employer Contribution Rate				
Regular Employment (and Midijobs)	7.95	7.95	8.10	8.15
...Minijobs	13.00	13.00	13.00	13.00
Employee Contribution Rate	7.95	7.95	8.10	8.15
Self-employed Contribution Rate[1]	15.90	15.90	16.20	16.30
Pensioner Contribution Rate	7.95	7.95	8.10	8.15

Notes: [1] This is the contribution rate to statutory health insurance that has been assumed in the simulation for the self-employed who have income from self-employment below the threshold for statutory health insurance.

Table 2.10 shows contribution rates to the statutory long-term care insurance over the years 2021 to 2024, differentiated by contribution rates for employers (for regular employment and for minijobs), employees, the self-employed, and pensioners. Since 2024 a novel scheme is applied. The more children below the age of 25 an individual has, the lower the contribution rate for long-term care insurance. Individuals with any number of children above 25 pay the standard rate.

Table 2.10 Social contributions: Statutory Long-term Care Insurance (rates in %)

	2021	2022	2023	2024
Employer Contribution Rate				
Regular Employment (and Midijobs)	1.525	1.525	1.525	1.700
Minijobs	0.000	0.000	0.000	0.000
Employee Contribution Rate				
Regular Rate	1.525	1.525	1.525	1.700
Additional Contribution Rate for childless	0.250	0.250	0.250	0.600
Reduction of Contribution Rate per child from two to five or more children below 25 years	0.000	0.000	0.000	0.250
Self-employed Contribution Rate[1]	-	-	-	
Pensioner Contribution Rate				
Regular Rate	3.050	3.050	3.050	3.400
Additional Contribution Rate for childless	0.250	0.250	0.250	0.600

Notes: [1] Long-term care insurance has not been simulated for the self-employed.

Table 2.11 shows contribution rates to the statutory unemployment insurance over the years 2021 to 2024, differentiated by contribution rates for employers (for regular employment and for minijobs), employees, the self-employed, and pensioners.

Table 2.11 Social contributions: Statutory Unemployment Insurance (rates in %)

	2021	2022	2023	2024
Employer Contribution Rate				
Regular Employment (and Midijobs)	1.20	1.20	1.30	1.30
...Minijobs	0.00	0.00	0.00	0.00
Employee Contribution Rate	1.20	1.20	1.30	1.30
Self-employed Contribution Rate[1]	-	-	-	-
Pensioner Contribution Rate	0.00	0.00	0.00	0.00

Notes: [1] Statutory unemployment insurance has not been simulated for the self-employed.

Table 2.12 shows contribution rates to the statutory accident insurance over the years 2021 to 2024, differentiated by contribution rates for employers (for regular employment and for minijobs), employees, the self-employed, and pensioners. Statutory accident insurance is paid completely by the employer. The contribution rate is based on occupation-specific risk. The numbers displayed here are ex-post average contribution rate. The most recent average contribution rate is assumed to be constant for the following years.

Table 2.12 Social contributions: Statutory Accident Insurance (rates in %)

	2021	2022	2023	2024
Employer Contribution Rate				
Regular Employment (and Midijobs)	0.96	1.12	1.12	1.12
...Minijobs	0.00	0.00	0.00	0.00
Employee Contribution Rate	0.00	0.00	0.00	0.00
Self-employed Contribution Rate[1]	-	-	-	-
Pensioner Contribution Rate	0.00	0.00	0.00	0.00

Notes: [1] Statutory accident insurance has not been simulated for the self-employed.

Employees and employers are obliged to pay statutory social insurance contributions from gross wages and salaries, unless gross income exceeds certain thresholds, which allows employees to contract out of statutory health and long-term care insurance. Employees who earn salaries above this threshold may choose private health insurance instead. Private health insurance premiums do not depend on gross income, but mostly on age, gender, and prior health conditions. Social insurance contributions are paid as fixed shares of gross income up to a contribution assessment ceiling. Gross income above this ceiling is disregarded. Employees who earn more than the assessment ceiling for statutory pension and unemployment insurance pay no additional contributions. The same applies for statutory health and long-term care insurance, the threshold is however defined differently

Contributions have been simulated for statutory pension insurance, compulsory statutory health insurance, statutory long-term care insurance, statutory unemployment insurance, and statutory accident insurance. Contributions were differentiated for four groups: employers, employees, self-employed and pensioners. Contributions to private health insurance could not be simulated precisely, as they do not depend on income, but rather on individual characteristics, like health status, age, and individual-specific illness risks. In the simulations, average contributions (observed in the SOEP micro data) to private health insurance, differentiated by self-employed, and pensioners, have been imputed.[11] Concerning private health insurance for regular employees, we assume that all employees eligible for private health insurance (income above the compulsory threshold) stay in statutory health insurance.

Civil servants are not covered by compulsory social insurance and are not obliged to pay contributions. The federal or state government provides financial assistance (approximately 50% to 80% of the expenses) in cases of illness, birth, long-term care and death and a retirement pension. Usually, civil servants have a private health insurance to insure against health costs not covered by the government's financial assistance. However, social insurance contributions for civil servants have not been simulated.

2.7.1 Employer Social Contributions (*tscer_de*)

Generally, in case of employees, all social contributions are split equally between employees and employers. Exceptions have been statutory health insurance, where the employer's contribution was lower until 2018, and long-term care insurance, where employees, who do not have children, have a 0.6 percentage points higher contribution rate and employees with more children a up to 1

[11] The within-group distribution of contributions to private health insurance is relatively homogeneous over age-groups so that a further differentiation of contributions by age groups does not appear to deliver much more relevant variation.

percentage point lower contribution rate. Statutory accident insurance is paid by employers only. Employers' contribution rates to the respective insurances are tabulated in Table 2.13.

Table 2.13 Employers' Social Security Contribution rates (in %)

	2021	2022	2023	2024
1. Pension social insurance (*tscerpi_s)*	9.300	9.300	9.300	9.300
2. Compulsory statutory health insurance *(tscerhl_s)*	7.950	7.950	8.100	8.150
3. Statutory long-term care insurance *(tscerci_s)*	1.525	1.525	1.525	1.700
4. Statutory unemployment insurance *(tscerui_s)*	1.200	1.200	1.300	1.300
5. Statutory accident insurance *(tscerac_s)*	0.960	1.120	1.120	1.120
6. Compulsory statutory health insurance (Minijob) *(tscerhl_s)*	13.000	13.000	13.000	13.000
7. Statutory pension insurance (Minijob) *(tscerpi_s)*	15.000	15.000	15.000	15.000
Total *(tscer_s)*	**20.935**	**21.095**	**21.345**	**21.570**
Total (Minijob) *(tscer_s)*	**28.000**	**28.000**	**28.000**	**28.000**

For mini jobs, employers have to pay contributions to statutory health and pension insurance. For 2021 the contribution rate amounted to 31.51%, in 2022 to 31.28% and to 31.4 % in 2023 and 2024. It consists of health insurance (13%), pension insurance (15%), a lump sum for payroll tax, solidarity surcharge, and church tax (2%), and certain levies (1.2% in 2018, and 1.15% in 2019 and 2020, 1.5% in 2021, 1.28% in 2022, 1.4% in 2023 and 2024) (see Minijob-Zentrale 2022). No contributions to the long-term care insurance and the unemployment insurance have to be paid in mini jobs. For midi jobs, employers pay their standard contribution rates, comprised of statutory health, long-term care, pension, and unemployment insurance.

Contributions were simulated on the basis of *yem*, i.e. observed income from employment, adjusted for the actual number of months of employment during the year (*yemmy*). Unit of analysis is the individual. Eligibility for all insurances conditions on not being a civil servant and having income below the respective thresholds for compulsory statutory insurance. In case of private health insurance, i.e. when income exceeds the threshold for statutory health insurance, employers' contributions are zero because employees pay the entire rate themselves.

2.7.2 Employee Social Contributions (*tscee_de*)

Employees' contribution rates to the respective insurances are tabulated in Table 2.14. As explained above, employees do not need to contribute to the statutory accident insurance, because employers pay the entire rate. This is similar with social contributions in mini jobs.

For midi jobs, employee's social insurance contributions are levied on fictitious earnings and are faded in until they reach the full rates at a gross wage of 2000 Euro. Fading-in of social contributions is determined by population-average social contribution rates (0.7509 in 2021 and 2022, 0.6922 in 2023 and 0.6846 in 2024). The fictitious earnings are based on the following formula (since Jan 2013):

$$FE = R * Mini + \left(\left(\frac{Midi}{Midi-Mini}\right) - \left(\frac{Mini}{Midi-Mini}\right) * R\right) * (E - Mini),$$

where FE stands for fictitious earnings, R is the population-average social contribution rate, $Midi$ is the midi job threshold (2000 Euro per months), $Mini$ is the mini job threshold (520 Euro) and E are actual earnings.

Simulation proceeds in a similar manner to employers' contributions. Again, contributions were simulated on the basis of *yem*, i.e. observed income from employment, adjusted for the actual number of months of employment during the year (*yemmy*). Unit of analysis is the individual. Eligibility for all insurances conditions on not being a civil servant and having income below the respective thresholds for compulsory statutory insurance (also see Section 1.3 for more details on these thresholds). In case of private health insurance, an average contribution is imputed for all employees, for whom income exceeds the threshold. The imputed mean contribution is the average contribution to private health insurance, paid for by employees in the SOEP data.

Table 2.14 Employees' Social Security Contribution rates (in %)

	2021	2022	2023	2024
1. Compulsory statutory pension insurance (*tsceepi_s)*	9.3000	9.3000	9.3000	9.3000
2. Compulsory statutory health insurance *(tsceehl_s)*	7.9500	7.9500	8.1000	8.1500
3. Statutory long-term care insurance *(tsceeci_s)*	1.5250	1.5250	1.5250	1.7000
4. Add. LTC contribution: childless *(tsceeci_s)*	0.2500	0.3500	0.3500	0.6000
5. Statutory unemployment insurance *(tsceeui_s)*	1.2000	1.2000	1.3000	1.3000
6. Statutory accident insurance *(tsceeac_s)*	0.0000	0.0000	0.0000	0.0000
7. Contributions factor for fading-in at Midi Jobs *(tsceehl_s)*	0.7509	0.7509	0.6922	0.6846
Total (tscee_s)	**20.225**	**20.225**	**20.475**	**21.735**

2.7.3 Self-Employed Social Contributions (*tscse_de*)

The self-employed are not covered by most of the statutory social insurances. Contributions to long-term care insurance, to unemployment insurance, and to accident insurance are entirely voluntary for the self-employed, and it cannot be assumed that self-employed opt for such insurances. Also, statutory health insurance is generally not compulsory for the self-employed in Germany, and most of the self-employed choose private health insurance. However, every individual in Germany is obliged to contribute to any health insurance, so that also the self-employed have to contribute to either of the two. Moreover, the self-employed are not generally obliged to contribute to compulsory pension insurance. However, certain groups of self-employed are obliged to contribute to statutory pension insurance. Compulsory pension insurance applies for self-employed teachers without employees, nurses, midwives, artists, publicists, and craftsmen.

Thus, only contributions to the statutory pension insurance and to statutory as well as private health insurance have been simulated for the self-employed. Mandatory contributions to the statutory pension insurance have been limited to those specific groups obliged to contribute, i.e. eligibility to pension insurance contribution is restricted to working either in education services, or in health services (*lindi*=10 or *lindi*=11), assuming that all income from self-employment in these services is subject to mandatory contributions to the statutory pension insurance. It is assumed that those obliged to contribute have to pay the entire rate (18.6% in 2021-2024).

The self-employed have in general been identified by their income, rather than their labor status. This means simulations are based on income from self-employment (*yse*). Thereby, there may be

individuals who pay contributions on both their pension income (*il_pen*) and on their income from self-employment (*yse*), but always in relation to respective income. However, eligibility is restricted to not reporting labor status employee (*les=3*), as the employees already pay contributions on their income from employment (*yem*).

Table 2.15 Self-employed Social Security Contribution rates[1] (in %)

	2021	2022	2023	2024
1. Compulsory statutory pension insurance (*tscsepi_s)*	18.6	18.6	18.6	18.6
2. Compulsory statutory health insurance (*tscsehl_s*)	15.9	15.9	16.2	16.3
Total *(tscse_s)*	**34.5**	**34.5**	**34.8**	**34.9**

Notes: [1] These are the contribution rates to statutory pension insurance and to statutory health insurance that have been assumed in the simulation for the self-employed (in health and education services only, for pension insurance). Long-term insurance, unemployment insurance, and accident insurance have not been simulated for the self-employed.

Self-employed with income from self-employment (*yse*) below the threshold for statutory health insurance, who do not report to be employees or civil servants, are assumed to contribute *voluntarily* to the statutory health insurance. They have to pay double the rate of employees as they have to pay the employer's share, too. For them, the income base that determines the contribution is the sum of income from self-employment, income from capital, and income from renting and leasing. Since 2009, there is a minimum and a maximum amount for this income.

Self-employed with income from self-employment (*yse*) *above* the threshold for statutory health insurance, who do not report to be employees or civil servants, are assumed to opt for private health insurance. In private health insurance, contributions do not depend on income, but on individual characteristics, like health status, age, and individual-specific illness risks. In the EUROMOD simulations, average contributions to private health insurance by the self-employed have been imputed. These averages are taken from the SOEP micro data. Contributions to private health insurance are not part of the income list *ils_sicse* to ensure that fiscal aggregates are matched better. The simulated contributions to private health insurance are stored under the variable *xhi_s*.

Contribution rates for self-employed in the statutory systems are shown in Table 2.15. Income thresholds and contributions have *not* been adjusted according to the actual number of months spent in employment (*yemmy*) during the year, in order to account for the fact that income from self-employment is distributed highly unevenly over the year. Unit of analysis is the individual.

2.7.4 Pensioner Social Contributions (*tscpe_de*)

Pensioners only have to contribute to the health insurance and to long-term care insurance. Depending on their pension income, they are assumed to be either insured compulsorily in the statutory health and thereby also the long-term care insurance, or in the respective private insurances (see the thresholds above). If pensioners are insured in the statutory insurances, they must pay 8.10% for health insurance and 3.4% for long-term care insurance in 2024. Accordingly, to employees, childless pensioners, born after 1939 and older than 23, have to pay an add-on of 0.6% to long-term care insurance. The rates are tabulated in Table 2.16.

Pensioners, with income from public pensions (*ils_pen*) exceeding the threshold for statutory health insurance, are assumed to opt for private health insurance. As for employees and the self-employed, average contributions made by pensioners in the SOEP data have been imputed as contributions to private health insurance for the pensioners.

Table 2.16 Pensioners' Social Security Contribution rates (in %)

	2021	2022	2023	2024
1. Compulsory statutory health insurance *(tscpehl_s)*	7.95	7.95	8.10	8.15
2. Statutory long-term care insurance *(tscpeci_s)*	3.05	3.05	3.05	3.40
3. Additional LTC contribution: childless *(tscpeci_s)*	0.25	0.25	0.25	0.6
Total *(tscpe_s)*	**11.25**	**11.25**	**11.40**	**12.15**

Simulations condition on not being a civil servant, assuming that this implies that pensioners have not been a civil servant earlier in life. Income thresholds and contributions are adjusted according to the actual number of months spent in retirement during the year. Unit of analysis is the individual.

2.7.5 Other Social Contributions (*tscot_de*)

Individuals who do not fall into the categories of employees, self-employed and pensioners and who are not family insured (*familienversichert*, see Section 1.3) are required by law to contract a health and long-term care insurance. These individuals are free to choose between public and private insurances. In EUROMOD it is assumed these individuals are publicly insured with the lowest possible health insurance contribution (as they have no or very low earnings). That is computed as the regular contribution rates for health and long-term care insurances for both employers and employees, which are then applied to a fictional minimum monthly income which is determined by the government each year (i.e. set by legislation) and deemed necessary to cover the most basic needs. Students who are older than 25 are offered a special – cheaper – contribution amount to the health and long-term care insurance. The students' contribution is also set by legislation by the government. Table 2.17 tabulates the fictional minimum monthly amount to which the regular contribution is applied and the special contribution amount for students older than 25.

Table 2.17 Minimum health and long-term care insurance contributions (in Euro per month)

	2021	2022	2023	2024
1. Fictional minimum monthly income	1096.67	1096.67	1131.67	1178.33
2. Contribution of students older than 25	106.56	111.45	123.59	133.33

Civil servants or the partners of civil servants are not liable for the contribution.

The following benefits cover the contribution (*tscot_s*): (most of) the old-age (*poa*) and disability benefits (*pdi*), unemployment Benefits I (*bunct_s*), sickness benefits (*bhl_s*), parental leave benefits (*bplct_s*), citizen's benefit (*bunnc_s*), social assistance for old-age and for reduced work ability (*bsaoa_s*) and general social assistance (*bsa00_s*). If the person or their family receive any of these benefits, then the contribution is set to zero (because the state pays the contribution).

Education benefits (*bed_s*) also cover the contribution. If a student is liable for the contribution, then the benefit amount is increased to cover the *tscot_s* amount. *Tscot_s* is also taken into account when calculating the relevant income for the means test of housing benefits (*bho00_s*) and additional child benefits (*bchot_s*), and it is (at least partially) covered by the benefits to the extent that the contribution lowers the relevant income for the means test.

EUROMOD modelling: If a person cannot afford to pay the contribution but they do not qualify for any benefit covering it (e.g. because of too much wealth, or because they have not claimed the

benefits they are entitled to), then they are obliged to sell part of their wealth to pay for the contribution. Such behavioural response is complicated to model (e.g. there can be feedback effects to the level of income tax/ benefit entitlement). Thus, at the expense of not modelling accurately the contribution policy, we assume that if the family's net income is less than the contribution, the person would not pay it (or they have sold part of their wealth, paid for the contribution and broke even w.r.t net income).

2.8 Direct taxes

Income tax is levied on the income of natural persons. Tax on income from dependent employment is collected from persons in dependent employment at source via payroll tax. However, these pre-payments on income are not final, so that usually income tax is declared at the end of the year, where pre-payments from payroll tax are considered, but also other sources of income that are not related to dependent employment come into play.

The simulation of personal income tax is divided into three policies. In the first policy (*tin_de*), taxable income is derived, and in the following two policies (*tinit_de* and *tinjt_de*), the tax schedule function is applied to individual and respectively joint taxation.

2.8.1 Taxable Income (*tin_de*)

In this policy, taxable income is derived. First of all, parameters for the tax schedule, as well as for allowances and deductions are defined. Then, income from the various sources, as far as it is taxable, is collected (see Table 2.18). Unit of analysis when deriving taxable income is the individual. In case relevant parameters differ by individual and joint taxation (namely capital income), these components of taxable income are added later in the respective policy.

Table 2.18 Determination of taxable income according to German Income Tax Law (§ 2 EStG)

Legal income concepts and their components	**EStG**
Income from agriculture and forestry	§§ 13 - 14a
+ Income from business enterprise	§§ 15 - 17
+ Income from self-employment	§ 18
+ Income from dependent employment	§ 19
+ Income from capital	§ 20
+ Income from renting and leasing	§ 21
+ Other income	§ 22
= Positive income from all sources	**§ 2 III**
– Negative income (loss compensation)	
= Income from all sources	**§ 2 III**
– Tax allowance for elderly persons (for people over 64)	§ 24a
– Tax allowance for agriculture and forestry	§ 13 III
– Single parents' tax allowance (*Entlastungsbetrag für Alleinerziehende*)	§ 24b
= Adjusted gross income	**§ 2 III**
– Special expenses (actual or lump-sum)	§§ 10 - 10c
– Extraordinary burden expenses (actual or lump-sum)	§§ 33 – 33c
– "Loss deductions" (reimbursements, loss carry forwards)	§ 10d
= Income	**§ 2 IV**
– Tax allowance for children (*Kinderfreibetrag*)	§ 32 VI
= **Taxable income** (the tax base)	§ 2
Progression Clause *(Progressionsvorbehalt)*	§ 32b
+ Unemployment Benefits	
+ Short-term Work Compensations	
+ Insolvency Benefits	
+ Severance Benefits	
+ Parental-leave Benefits	
+ Sickness benefits	
+ Injury Benefits	
+ Sickness Benefits for Military People	
+ Maternity-leave Benefits	
+ Transfer Short-term Work Compensations	
+ Seasonal Short-term Work Compensations	
+ Unemployment Benefits for Part-time Unemployment	
+ Benefits for Early Retirement	
+ Supplemented labour costs for employment	
= **Taxable income according to p.c.** (determining the tax rate)	§ 32b

Source: Steiner, Wrohlich, Haan, and Geyer (2008).

- ***Tax Base***

Income from employment, from self-employment, from property,[12] from other sources, and income in kind is entirely taxable and thus added up as observed (*il_taxy*). Since 2005, income from pensions is only taxable with a pre-defined share, which depends on the (calendar) year of entrance into retirement in case of private pensions and on the age at entrance into retirement in case of statutory pensions, and it remains constant, conditional on these two.

- ***Tax Allowances***

Then, various allowances and deductions, which are assessed at the individual level, are deducted from "taxable income before allowances". Below there is an explanation of all simulated allowances and deductions.

a) Allowance on income from pensions *(Rentenfreibetrag)* (EUROMOD variable tintape_s)

The tax treatment of pension income depends on the year in which each individual enters retirement. Given that information on retirement entry is not available, the simulation of this allowance assumes that individuals have entered retirement at age 65. For those individuals for whom we observe pension income at a younger age in the input data, we assume that they have entered retirement in each policy year. The amount of the allowance on pension income also depends on the concrete source:

- pensions from statutory sources (poass, poa00, poaps, poapu): for those entering retirement in 2005 or before, the allowance amounts to 50% of their pension. Every year, this rate diminishes by 2 percentage points until 2020, by 1 percentage point in 2021 and 2022 and by 0.5 percentage point since 2023 until pensions will be fully subject to income taxation in 2040 (e.g. for those entering retirement in 2024 the allowance amounts to 17% of their pension).
- pensions for civil servants (poacs): for those entering retirement in 2005 or before, the allowance amounts to 40% of their pension, capped at a maximum of 3,000 Euro per year. Every year, this rate diminishes by 1.6 percentage points until 2020, by 0.8 percentage point in 2021 and 2022 and by 0.4 percentage points since 2023 (e.g. for those entering retirement in 2024, the allowance amounts to only 13.6% of their pension, capped at a maximum of 1,020 Euro per year).
- private pensions (ypp): under the assumption that all individuals enter retirement at age 65, the allowance on private pensions amounts to 82% and has stayed constant over the years.

b) Tax-exemption from Minijob earnings (EUROMOD variable tintcly_s)

Earnings from Minijobs (i.e. dependent employment paying up to 520 Euro per month) are tax exempt.

c) Allowance on income from the elderly (*Altersentlastungsbetrag*; EUROMOD variable tinta00_s)

This allowance applies to all income sources with the exception of pension income received by people aged 65 and older. The amount of the allowance depends on the individuals' year of birth and decreases the younger individuals are. For each cohort, the allowance is calculated as a percentage of income, capped at a maximum.

d) Deduction of income-related expenses (*Werbungskostenpauschale*; EUROMOD variable tintaee_s)

[12] Income from property is income from renting and leasing of non-owner occupied housing. This has been subject to personal income tax in all the years throughout 2020 to 2023. The change at the taxation of capital income does not apply to income from property.

There is a lump-sum allowance of 1,230 Euro per year that is applied in case income from employment (yem) exceeds 1,230 Euro and the individual does not claim income-related expenses, e.g. for commuting to the work place or for work equipment, exceeding the threshold of 1,230 Euro per year. In EUROMOD only this lump-sum allowance is simulated. This decision is likely to undersimulate the deduction of income-related expenses for certain groups of people, such as those with a long commute to work whose costs exceed the 1,230 Euro per year. Unfortunately, there is no information available which could be used to simulate this deduction more accurately.

e) Allowance on earnings from agriculture (EUROMOD variable tintaag_s)

There is also a tax allowance for taxpayers in the agriculture and forestry sector. It amounts to 900 Euro per year for a single person (1,800 Euro for couples), but it is only granted in case total income from employment does not exceed 30,700 Euro per year (61,400 Euro for couples). This allowance was constant over the years.

f) Allowance for single parents (*Entlastungsbetrag für Alleinerziehende*; EUROMOD variable tintalp_s)

There is an allowance for single parents which amounted to 4,008 Euro per year for 2021 and 2022. In 2023, the allowance increased to 4,260 Euro per year and stayed constant in 2024. In addition, the allowance is further increased by 240 Euro per year for each additional child in the household.

g) Deduction of old-age expenses (EUROMOD variable tintapv_s)

Deductions of old-age expenses are made up of the sum of two components: one based on the contributions made to the pension insurance and one based on the contributions made to health and long-term care insurance. The first component is computed as follows in two steps: first, all contributions (including employers' contributions) made to the pension insurance up to a maximum, which changes every year (25,787 Euro per year in 2021, 25,639 Euro in 2022, 26,528 Euro in 2023 and 27,566 Euro in 2024), are computed. Then, the allowance is computed as a percentage of this amount, which increases by 2 percentage points every year (i.e. was 88% in 2019; 90% in 2020; etc) and reaches 100% in 2023, minus the employer's contribution. The second component consists of all contributions made to health and long-term care insurance, regardless of the (non-) employment status of individuals.

h) Deduction of childcare expenses (EUROMOD variable tintace_s)

Parents also can deduct two thirds of their childcare expenses up to a maximum of 4,000 Euro per year. Given that we do not have any information on actual childcare expenses, EUROMOD simulates the totality of the deduction for working parents with children up to the age of 12 who attend pre-school or primary school combined with paid childcare. For couple parents, the deduction is only simulated if both parents work. This is no part of the policy but rather a calibration of the simulation, as families with a stay-home parent are likely to use less hours of paid childcare. Due to missing data on the actual take-up of paid child-care from 2023 on, we only consider children in pre-school for the deduction.

i) Deduction of special expenses: alimonies (EUROMOD variable tintasp_s)

Alimony payments (variable *xmpam*) can also be deducted up to a maximum of 13,805 Euro per year, which has stayed constant over the years.

j) Child tax allowance (*Kinderfreibetrag*) (EUROMOD variable tintach_s)

The child tax allowance is granted to parents instead of child benefits in case the allowance is more beneficiary for the taxpayers than the child benefits. The allowance per couple amounted to 8,388 Euro in 2021 and 2022, 8,952 Euro in 2023 and 9,312 Euro in 2024. Since 2000, it includes

an allowance for childcare. In the case of couple's separation, each parent is entitled to half of the allowance (4,194 Euro in 2021 and 2022, 4,476 Euro in 2023, 4,656 Euro in 2024).

EUROMOD modelling: In the case of couple's separation, if one of the parents does not pay at least 75% of the maintenance allowance, then the other parent can claim the full amount of the tax allowance. Since we do not have detailed information on maintenance payments, we assume that lone parents always claim half of the allowance. Furthermore, we can only identify eligible parents if the children reside with them.

Accounting for all these allowances and deductions, "taxable income" follows.

2.8.2 Individual Taxation (*tinit_de*)

In this policy (*tinit*_de), the tax function is applied to the case of individual taxation. Generally, the simulation of the tax function is structured as follows:

1) Firstly, the relevant average tax rate is determined for all individuals who are subject to individual taxation, by applying taxable income and further accounting for progression clause (by adding related benefits to taxable income). Taxable income including benefits is put into the schedule, and a tax burden is returned. This, however, is not the final burden, it only determines the rate. The resulting average tax rate – applied to taxable income, *excluding benefits* – determines the relevant tax burden. This is the tax burden, before accounting for the child allowance.

2) Secondly, the child allowance is accounted for, in case it applies. It applies if the individual has at least one dependent child in the household that is eligible for child benefits (see Section 1.2.5 for eligibility criteria). The child allowance reduces taxable income if it applies. The tax burden is derived again. Again, progression clause must be accounted for, i.e. benefits are considered when the tax rate is determined, but they are excluded from the actually taxed income.

3) Now, a higher-yield test is undertaken in order to determine which of the two is more profitable for the tax unit, the application of the child allowance, or the receipt of child benefits. The reduction of tax burden resulting from the application of the allowance is compared to the annual receipt of child benefits for all eligible dependent children of the tax unit. If child benefits are more profitable, the child allowance is not applied. In case the child allowance is more profitable, it is applied and the sum of received child benefits is added to the tax burden (also see below at Tax Allowances). The child allowance is usually more beneficial for the high-income individuals.

4) Next, tax burdens for the two groups, the childless and individuals with children are assembled in the variable *tinit_s*.

5) Then, if applicable, the solidarity surcharge is computed (variable *txc_s*). If the income tax liability is less than the tax exemption threshold (of 18,130 Euro per year), no solidarity surcharge is due. If the income tax exceeds the tax exemption threshold, a solidarity surcharge of 5.5% is levied on the income tax. However, the solidarity surcharge cannot be higher than 11.9% of the income tax amount exceeding the tax exemption threshold.

6) Finally, the solidarity surcharge is added to the previously computed tax burden, which is saved in the variable *tinit_s*. This is the relevant tax burden for each individual, and an average tax rate follows.

- ***Tax Unit***

Individual taxation has been simulated for all individuals who are either not married or who are married but do not live with a partner in the same household. The unit of analysis thus is the individual, in the entire policy. There is no need to allocate any income, allowance, or tax burden among partners, as each of them is taxed entirely individually, if subject to individual taxation.

- ***Tax Exemptions***

There are a couple of exemptions in German income tax law. As described before, a specific element of the German income tax law is the progression clause. Even though not included in the tax base, most of the contributory benefits are included in the base used to determine the tax bracket of the progressive income tax schedule. In this way these incomes may increase the income tax rate used for the other income sources that are subject to the income tax.

Progression clause is implemented in the simulation of individual taxation. The contributory benefits that are subject to progression clause are added to taxable income, and the resulting income determines the relevant tax bracket and rate. This rate in turn is, however, applied to taxable income, excluding the contributory benefits.

- ***Tax Allowances***

The tax allowances are described in Section 2.8.1.

EUROMOD modelling: The child tax allowance needs specific treatment in the simulation. Due to the higher yield test, i.e. the check whether the child allowance is more beneficiary for the taxpayers than the child benefits, income taxation needs to be simulated twice, once with and once without the child allowance. At individual taxation, the entire child allowance is considered at each parent filing individual taxation.

- ***Tax Base***

Income from six different sources is summed up for each individual. After loss compensation and several allowances and deductions are considered, taxable income, i.e. the tax base, is taxed according to a progressive tax schedule. Table 2.18 shows in more detail how taxable income is determined. Income from single components is added up and certain expenditures are credited against income, as well as certain allowances are granted. This has been described in detail in Section 2.8.1. In this policy (*tinit_de*), in addition capital income is added, and the relevant taxable income results.

EUROMOD modelling: Losses are not observed in the data. Thus, they are assumed to be zero, or negligibly small, such that they can be neglected in the simulation. Also, any other specific extraordinary burden expenses that are not observed in the data are assumed to be negligible and are not considered in the simulation.

- ***Tax Schedule***

The tax schedule from the personal income taxation in Germany has progressive elements (see **Error! Reference source not found.** and following). Due to a basic tax-free allowance (9,744 Euro in 2021, 10,347 Euro in 2022, 10,908 Euro in 2023 and 11,608 Euro in 2024) and several tax brackets beyond this allowance, the entire schedule has a progressive effect.

Table 2.19 Personal Income Tax Schedule (2021)

Bracket	Lower limit (for *Y*)	Upper limit (for *Y*)	Marginal Tax Rate (%)	Tax Burden (TAX)
1	0	9,744	0	$TAX = 0$ *(tax-free allowance)*
2	9,745	14,753	14-24	$TAX = (995.21*Z_1 + 1{,}400)*Z_1$ $Z_1 = (Y - 9{,}744)/10\,000$
3	14,754	57,918	24-42	$TAX = (208.85*Z_2 + 2{,}397)*Z_2 + 950.96$ $Z_2 = (Y - 14{,}753)/10{,}000$
4	57,919	274,612	42	$TAX = 0.42*Y - 9{,}136.63$
5	274,613	-	45	$TAX = 0.45*Y - 17{,}374.99$

Table 2.20 Personal Income Tax Schedule (2022)

Bracket	Lower limit (for *Y*)	Upper limit (for *Y*)	Marginal Tax Rate (%)	Tax Burden (TAX)
1	0	10,347	0	$TAX = 0$ *(tax-free allowance)*
2	10,348	14,926	14-24	$TAX = (1088.67*Z_1 + 1{,}400)*Z_1$ $Z_1 = (Y - 10{,}347)/10\,000$
3	14,927	58,596	24-42	$TAX = (206.43*Z_2 + 2{,}397)*Z_2 + 869.32$ $Z_2 = (Y - 14{,}926)/10{,}000$
4	58,597	277,825	42	$TAX = 0.42*Y - 9{,}336.45$
5	277,826	-	45	$TAX = 0.45*Y - 17{,}671.20$

Table 2.21 Personal Income Tax Schedule (2023)

Bracket	Lower limit (for *Y*)	Upper limit (for *Y*)	Marginal Tax Rate (%)	Tax Burden (TAX)
1	0	10,908	0	$TAX = 0$ *(tax-free allowance)*
2	10,909	15,999	14-24	$TAX = (979.18*Z_1 + 1{,}400)*Z_1$ $Z_1 = (Y - 10{,}908)/10{,}000$
3	16,000	62,809	24-42	$TAX = (192.59*Z_2 + 2{,}397)*Z_2 + 966.53$ $Z_2 = (Y - 15{,}999)/10{,}000$
4	62,810	277,825	42	$TAX = 0.42*Y - 9{,}972.98$
5	277,826	-	45	$TAX = 0.45*Y - 18{,}307.73$

Table 2.22 Personal Income Tax Schedule (2024)

Bracket	Lower limit (for *Y*)	Upper limit (for *Y*)	Marginal Tax Rate (%)	Tax Burden (TAX)
1	0	11,604	0	$TAX = 0$ *(tax-free allowance)*
2	11,605	17,005	14-24	$TAX = (922.98*Z_1 + 1,400)*Z_1$ $Z_1 = (Y - 11,604)/10,000$
3	17,006	66,760	24-42	$TAX = (181.19*Z_2 + 2,397)*Z_2 + 1025.38$ $Z_2 = (Y - 17,005)/10,000$
4	66,761	277,825	42	$TAX = 0.42*Y - 10,602.13$
5	277,826	-	45	$TAX = 0.45*Y - 18,936.88$

Taxable income falls into five different tax brackets. There is a basic tax allowance. Within the progressive tax schedule, the lowest marginal tax rate is at 14% and the highest at 45%. The latter applies to a taxable income above 277,826 Euro in 2023 and 2024. The only flat areas, where the tax rate is constant, are in this highest bracket and in the second highest bracket, where a tax rate of 42% applies. Up to a marginal tax rate of 42%, the tax rate increases continuously and is determined by two different equations that apply within the two brackets.

This tax schedule is the base for all simulations, i.e. it applies to the determination of the relevant tax rate when accounting for progression clause, either with or without accounting for the child allowance. It also applies identically to individual and to joint taxation. At the latter it applies to the mean income of the spouses. This means that the bracket thresholds are, loosely speaking doubled in case of joint taxation.

EUROMOD modelling: Several elements of the tax schedule (e.g. Z_1 and Z_2) are computed in temporary variables during the simulation (in the form of *int_##_s*). These are only applied within the tax schedule at the computation of the tax burden and have no further function in the simulation.

- ***Tax Credits***

There are no explicit tax credits in German income tax law. Any allowances and deductions are only applied as far as taxable income is greater than zero. There is no such case that taxable income can be negative and a tax credit is refunded.

2.8.3 Joint Taxation (*tinjt_de*)

In the German income tax system, married couples are taxed jointly with full income splitting, i.e. the tax function is applied to half of the sum of the spouses' taxable incomes, and then the resulting tax amount is doubled. In the simulation (*tinjt_de*), joint taxation has been implemented. It is assumed that all married couples, i.e. those who report to be married and live together with a partner, opt for joint taxation. Married couples can only be better off or indifferent when choosing joint taxation, but never be worse off than when choosing individual taxation. For all other individuals, individual taxation has been simulated.

In this policy (*tinjt_de*), the tax function is applied to the case of joint taxation. Generally, the simulation of the tax function is structured in the same way as for individual taxation, some detailed differences apply:

1) First, the relevant average tax rate is determined for all married couples, by applying taxable income and again accounting for progression clause (by adding related benefits

to taxable income). Now, the crucial difference to individual taxation is that for married couples their mean income is applied, i.e. their taxable incomes, including benefits from progression clause, and after accounting for all allowances, are summed up over the two spouses and divided by two. This is the relevant taxable income of the couple. This taxable income is put into the schedule, and a tax burden is returned. Again, this is not the final burden, it only determines the rate. The resulting average tax rate -- applied to taxable income, *excluding benefits* – determines the relevant tax burden. This tax burden is multiplied by two in order to account for the fact that only half of the spouses' income is put into the schedule. This is the relevant tax burden of the couple, before accounting for the child allowance.

2) Secondly, the child allowance is accounted for, in case it applies. It applies if the married couple has at least one dependent child in the household that is eligible for child benefits (see Section 1.2.5 for eligibility criteria). The amount of the allowance is doubled for married spouses (also see below at Tax Allowances). The child allowance reduces taxable income if it applies. The tax burden is derived. Again, progression clause must be accounted for, i.e. benefits are considered when the tax rate is determined, but they are excluded from the actually taxed income.

3) Thirdly, the higher-yield test is undertaken in order to determine which of the two is more profitable for the tax unit, the application of the child allowance, or the receipt of child benefits. This is done analogously to individual taxation.

4) Then, the resulting tax burden is allocated among the two married spouses, according to their taxable income. This is the relevant tax burden for each married spouse, at the individual level, i.e. assigned to each spouse.

5) Next, if applicable, the solidarity surcharge is computed (variable *txc_s*). The solidarity surcharge for joint taxation is calculated in the same way as for individual taxation. The tax exemption threshold is of 36,260 Euro per year (twice the amount for individual taxation) (for more details see Section 2.6.2). Analogously to the regular tax burden, it is first computed at the couple level and then allocated among the two married spouses according to their taxable income. It is then added to the regular tax burden.

6) Finally, tax burdens (including the solidarity surcharge) for the two groups of spouses, childless couples and couples with children, are assembled and added to the tax burden of those taxed individually (*tin_s)*. Again, an average tax rate can be calculated.

- ***Tax Unit***

Generally, in joint taxation, the unit of analysis is the couple of married spouses. This is necessary to account for the fact that for married spouses, incomes are summed up and tax burdens in turn allocated. However, when the schedule is actually applied to the mean income of the spouses, it only needs to be applied to the head of the household, as the relevant taxable income of the married couple (*temp_11_s*) has been assigned to the head. Thus, for the simulation of the schedule, the unit of analysis technically is the individual, i.e. the household head.

EUROMOD modelling: Generally, the head of the household of a married couple need not necessarily be one of the spouses of the couple. In multi-generational households, there can be more than one married couple. In the data for Germany, however, there is no household with more than one married couple. Therefore, the simplification of assigning taxable incomes of the married couple to the household head is appropriate.

- ***Tax Exemptions***

As for individual taxation, the benefits that are subject to progression clause are generally exempt from income tax. Also at joint taxation, progression clause is implemented in the simulation.

- ***Tax Allowances***

The tax allowances are described in Section 2.8.1.

EUROMOD modelling: Also at joint taxation, the child tax allowance needs specific treatment in the simulation. Due to the higher yield test, i.e. the check whether the child allowance is more beneficiary for the taxpayers than the child benefits, income taxation needs to be simulated twice, once with and once without the child allowance.

- ***Tax Base***

Firstly, for each spouse separately, income from six different sources is summed up, and several allowances and deductions are accounted for (already in policy *tin_de*). This income is then summed up over the two married spouses and the average income is applied. This is the relevant taxable income for the couple, which is the tax base.

- ***Tax Schedule***

The same tax schedule, as for individual taxation, also applies to joint taxation (see Table 2.19 to Table 2.22). At the latter it applies to the mean income of the spouses. This means that the bracket thresholds are, loosely speaking doubled in case of joint taxation.

EUROMOD modelling: Again, several elements of the tax schedule (e.g. Z_1 and Z_2) are computed in temporary variables during the simulation (in the form of *int_##_s*). These are only applied within the tax schedule at the computation of the tax burden, and have no further function in the simulation.

- ***Tax Credits***

There are also no explicit tax credits that apply to joint taxation in German income tax law.

2.8.4 Capital Income Taxation (*tinkt_de)*

Since 2009 there is a final withholding tax on capital with a flat tax rate of 25%[13], which is simulated in policy *tinkt_de*. This rate applies above a saver's tax allowance, which amounts to 1000 Euro for single persons in 2024 – for couples, it is doubled.

- ***Tax Unit***

The tax unit for capital income taxation is the same as the unit for personal income taxation. This holds for all the years 2021-2024. It is again assumed that married couples choose joint taxation. Thus, capital income for married couples is joint income and accordingly, married couples get granted double the tax-free allowance on capital income.

- ***Exemptions***

There are no exemptions for capital income taxation. All income that is considered capital income is subject to capital income taxation. This holds for interest income from savings accounts or

[13] The rate of 25% excludes the solidarity surcharge of 5.5% on the tax burden. The effective rate would be 26.375% (excluding church taxes of 8% or 9%, depending on confession). However, church taxes have not been simulated in EUROMOD.

bonds, as well as for dividends and other pay-outs. It also holds for gains from price arbitrage sales of assets.

- ***Tax Allowances***

There is a basic allowance for income from capital, which was increased to 1,000 Euro. Income from the investment of capital is tax exempt as far as it falls below this threshold. For married couples, the double of this allowance is granted.

Table 2.23 Capital Income Taxation: Basic Allowance (2021-2024)

Allowances	2021	2022	2023	2024
- Singles	801	801	1,000	1,000
- Married Couples	1,602	1,602	2,000	2,000

- ***Tax Base***

The tax base is all income from capital. This is interest income from savings accounts or bonds, as well as from dividends and other pay-outs. Also gains from price arbitrage sales of assets, e.g. when stocks are bought at a lower price than they are sold, falls under capital income.

- ***Tax Schedule***

The tax rate is a flat rate of 25%.

- ***Tax Credits***

There are no tax credits for capital income taxation.

2.9 Consumption taxes

Consumption taxes simulated in EUROMOD can be divided in two groups: VAT (value added tax) and excises (additional duties paid over consumption, typically on energy, alcoholic beverages, and tobacco).

Simulated consumption tax liabilities paid by households depend on the tax rules (e.g. the VAT rate) and on the tax base (consumption expenditures or quantities). This is why, to simulate consumption taxes in EUROMOD, the input data must contain information on household expenditures. The expenditures matched in the EUROMOD input files based on SILC are reported directly by households in the HBS surveys at purchasing prices. Therefore, they already include the consumption taxes paid.

i) VAT (il_tva variable in EUROMOD) is the value-added tax. The model also simulates at high disagregation level the VAT liabilities paid for each consumption category (output variables are tva01111, tva01112, and so on and so forth, corresponding to COICOP codes 01111 and 01112, etc.)

ii) Excises (il_tx variable in EUROMOD) are additional duties paid over consumption and can be classified in two groups: ad-valorem excises (il_txv) that depend on producer prices, and of specific or ad-quantum excises (il_txa) that depend on consumed quantities.

Since consumption data from HBS refers to expenditures (price times quantity), for the simulation of specific excises information on consumption prices are needed.

Further information on methodology and specific calculations and the independence of these consumption taxes is common across countries (this is why they are placed in an add-on and not in the policy spine of each country) and can be found in Akoğuz et al (2020)[14].

2.9.1 VAT (il_tva)

To extract the baseline VAT embedded in the expenditure consumption reported by households we only need the VAT rate of the policy system year. VAT rates usually do not vary too much across product, and are typically three rates (standard, reduced and zero), although in some countries there are more.

Table 2.24 VAT rates [2021-2024]

	Products	2021	2022	2023	2024
Standard[1]		19 %	19 %	19 %	19 %
Reduced	Food, Transport, Cultural and recreational activities, accommodation, in 2023 Gas, from 2021 to 2023 restaurants	7 %	7 %	7 %	7 %
Zero	Rents, Medical services, postal services, education, insurances	0%	0%	0%	0%

2.9.2 Specific excises (il_txa)

Specific excises apply to fossil energy products, electricity, alcohol products and tobacco products. In this case, we collect both tax parameters and consumer prices, to allow the model to estimate the implicit quantities behind the reported household consumption expenditure amounts. Excise rates have been constant except for cigarettes and fine cut, for which rates have been constantly increased.

Table 2.25 Specific ad-quantum excise rates [2021-2024]

Products	2021	2022	2023	2024
Ethyl alcohol	1303 Euro per 100 l of pure alcohol	1303 Euro per 100 l of pure alcohol	1303 Euro per 100 l of pure alcohol	1303 Euro per 100 l of pure alcohol
Wine	0 Euro per 100 l	0 Euro per 100 l	0 Euro per 100 l	0 Euro per 100 l
Sparkling Wine	136 Euro per 100 l	136 Euro per 100 l	136 Euro per 100 l	136 Euro per 100 l

[14] *Akoğuz, Elif Cansu, Bart Capéau, André Decoster, Liebrecht De Sadeleer, Duygu Güner, Kostas Manios, Alari Paulus, and Toon Vanheukelom. A new indirect tax tool for EUROMOD: final report. Technical Report, https://euromod-web. jrc. ec. europa. eu/sites/default/files/2021-03/A% 20new% 20indirect% 20tax% 20tool% 20for% 20EUROMOD% 20Final% 20Report. pdf, 2020.*

Beer	0.787 Euro per 100 L per Plato of finished product	0.787 Euro per 100 L per Plato of finished product	0.787 Euro per 100 L per Plato of finished product	0.787 Euro per 100 L per Plato of finished product
Cigarettes	98.2 Euro per 1000 pieces	108.8 Euro per 1000 pieces	111.5 Euro per 1000 pieces	111.5 Euro per 1000 pieces
Cigars	14 Euro per 1000 pieces	14 Euro per 1000 pieces	14 Euro per 1000 pieces	14 Euro per 1000 pieces
Fine cut	48.49 Euro Fine cut, per kg	49.65 Euro Fine cut, per kg	54.39 Euro Fine cut, per kg	54.39 Euro Fine cut, per kg
Electricity	20.5 Euro per MWh	20.5 Euro per MWh	20.5 Euro per MWh	20.5 Euro per MWh
Natural Gas	1.53 Euro per gigajoule	1.53 Euro per gigajoule	1.53 Euro per gigajoule	1.53 Euro per gigajoule
Liquefied hydrocarbons	60.6 Euro per 1000 kg	60.6 Euro per 1000 kg	60.6 Euro per 1000 kg	60.6 Euro per 1000 kg
Gas Oil Heating > 50	76.35 Euro per 1000L	76.35 Euro per 1000L	76.35 Euro per 1000L	76.35 Euro per 1000L
Gas Oil Heating <= 50	61.35 Euro per 1000L	61.35 Euro per 1000L	61.35 Euro per 1000L	61.35 Euro per 1000L
Coal and Coke	0.33 Euro per gigajoule, 1 GJ = 0.0316 ton	0.33 Euro per gigajoule, 1 GJ = 0.0316 ton	0.33 Euro per gigajoule, 1 GJ = 0.0316 ton	0.33 Euro per gigajoule, 1 GJ = 0.0316 ton
Petrol – Leaded	721 Euro per 1000L	721 Euro per 1000L	721 Euro per 1000L	721 Euro per 1000L
Petrol – Unleaded >10mg/kg	669.8 Euro per 1000L	669.8 Euro per 1000L	669.8 Euro per 1000L	669.8 Euro per 1000L
Petrol – Unleaded <=10mg/	654.5 Euro per 1000L	654.5 Euro per 1000L	654.5 Euro per 1000L	654.5 Euro per 1000L
Gas Oil – Propellant > 10mg/kg	485.7 Euro per 1000L	485.7 Euro per 1000L	485.7 Euro per 1000L	485.7 Euro per 1000L
Gas Oil – Propellant <= 10mg/kg	470.4 Euro per 1000L	470.4 Euro per 1000L	470.4 Euro per 1000L	470.4 Euro per 1000L

Table 2.26 Prices of excise products [2021-2024]

Prices	2021	2022	2023	2024[n]
Ethyl alcohol	18.32 Euro per 1 unit of Spirit	18.89 Euro per 1 unit of Spirit	20.24 Euro per 1 unit of Spirit	20.74118 Euro per 1 unit of Spirit
Wine	6.26 Euro per 1 l	6.55 Euro per 1 l	7.12 Euro per 1 l	7.276696 Euro per 1 l
Sparkling wine	25.82 Euro per 1 l	27.05 Euro per 1 l	29.38 Euro per 1 l	30.02659 Euro per 1 l
Beer	1.79 Euro per 1 l of beer	1.9 Euro per 1 l of beer	2.13 Euro per 1 l of beer	2.183295 Euro per 1 l of beer
Cigarettes	305.26 Euro per 1000 pieces	312.79 Euro per 1000 pieces	324.66 Euro per 1000 pieces	340.7178 Euro per 1000 pieces
Cigars	278.6 Euro per 1000 pieces	313.1 Euro per 1000 pieces	339.3 Euro per 1000 pieces	359.2113 Euro per 1000 pieces

Other tobacco	151.99 Euro per kg	160.66 Euro per kg	179.04 Euro per kg	188.2016 Euro per kg
Electricty	326.7 Euro per MWh	342.1 Euro per MWh	420.3 Euro per MWh	410.3133 Euro per MWh
Natural Gas-Heating	18.33 Euro per gigajoule	23.71 Euro per gigajoule	33.1 Euro per gigajoule	34.05785 Euro per gigajoule
Liquefied hydrocarbons	2393.6 Euro per 1000 kg	3638.61 Euro per 1000 kg	2393.77 Euro per 1000 kg	2656.039 Euro per 1000 kg
Gas Oil- Heating	758.22 Euro per 1000 l	1368.1 Euro per 1000 l	1105.78 Euro per 1000 l	1160.618 Euro per 1000 l
Coal and Coke - Heating	26.51 Euro per gigajoule	34.77 Euro per gigajoule	51.77 Euro per gigajoule	54.64574 Euro per gigajoule
Petrol-Unleaded >10mg/kg	1582.9 Euro per 1000 l	1923.35 Euro per 1000 l	1850.08 Euro per 1000 l	1881.819 Euro per 1000 l
Gas Oil-Propellant <=10mg/kg norm	1388.9 Euro per 1000 l	1954.39 Euro per 1000 l	1727.73 Euro per 1000 l	1793.233 Euro per 1000 l

n: nowcasted

Consumer prices of goods subject to excise duties are nowcasted, similarly to what the model does to update incomes from SILC. We combine the latest available data from the following sources:

- Prices per product, usually from last year, but for instance, fuel prices have only 15 days delay.
- Inflation: Harmonised Index of Consumer Prices (HICP, Eurostat) at COICOP 5 digits, usually for the first quarter for beta release and up to third quarter 3 for final release.
- Inflation quarter-on-quarter forecasts (DG ECFIN, confidential) by HICP main groups (unprocessed food, processed food including alcohol and tobacco, non-energy industrial goods, energy, services - overall index excluding goods) of quarters 2, 3 and 4, as needed for each release.

For more details on the specific source of the price of each good, see Akoğuz et al (2020).

The price of (indicate product) did not followed this general sources/nowcasting strategy but was sourced from (indicate source) because (indicate reason).

***EUROMOD modelling*:** Consumption taxes (tco_cc policy) require extended EUROMOD input data (with imputed income shares of consumption expenditures at the household level) and an add-on to run. The policy is set to off in the baseline. To activate it, the CT_xbase add-on must be run, and the extended EM input files (see Section 3 for more information on the methodology and features behind these extended input files) should be selected (as defined in the database configuration of each country). The other add-ons (CT_*) are designed for reform simulations and assume different behavioural responses: i) constant quantities (CT_XCQ), ii) constant income shares (CT_XCIS), and iii) constant expenditure shares (CT_XCES). These reform-scenario add-ons require the auxiliary output files are generated by running the first baseline simulation (as either the quantities or expenditures and savings from the baseline are kept constants and enter as inputs in the simulated reform scenarios).

3. DATA

3.1 General description

From 2021 onwards, a new database to produce the EUROMOD input data has been provided by Eurostat – the EUROMOD SILC databases (EMSD). In general, the EMSD includes the UDB of EU-SILC, national data provided by national statistical offices and EUROMOD variables that have been imputed by Eurostat using more precise EU-SILC data that underlies certain disclosure rules in publicly available data sets. For Germany no national data will be used, making EU-SILC the only data source for the German EMSD.

The German contribution to the EU-SILC has been collected by the national statistical office for Germany (*Statistisches Bundesamt*), under the label "*LEBEN IN EUROPA*" up to 2020. Every year about 14,000 households have been contacted by postal mail, and participation in this survey is voluntary. Households were recruited in random samples from an access panel. The access panel consisted of a standing pool of households that have been recruited from the German micro census (*Mikrozensus*). The German micro census consists of a 1% sample of the total German population. With the survey year 2020 the German contribution to EU-SILC is integrated into the new designed micro census. This constitutes a major change in many ways. Firstly, the sample size of German is noticeably larger than under the label "*LEBEN IN EUROPA"*. It now consists of a up to 12% sample from a 90% subsample of the micro census.

Secondly, the random samples of "*LEBEN IN EUROPA*" have been stratified by residence (federal state), household composition, social status of the household head, and net household income. The new integrated EU-SILC survey is a sample of stratified areas based on information of the German Census from 2011.

A further major change that comes with the integration of the micro census is that survey respondents are now generally legally obliged to answer the survey. Compared to the previous voluntary participation in "*LEBEN IN EUROPA"* this leads to the already mentioned higher sample size, but also to a different, more representative sample. On the other hand, the integrated EU-SILC still has voluntary questions which leads to a higher overall number of missing answers. In addition, in case of the 2020 survey, non-response to the micro census was not sanctioned due to the COVID pandemic leading to a high non-response rate of about 35%.

The assessment unit is individuals aged 16 or older, living in private households in Germany. The target population is the population living in private households in Germany, except for people in institutions, i.e. for example soldiers living in military caserns, or old people living in nursing homes. A household usually consists of individuals living together and sharing major expenses for daily living. Typically, sub-tenants, guests, au-pair people, and domestic staff do not belong to the household.

The national SILC data have been harmonized by the national statistical office to fulfil the comparability requirements of EU-SILC, elaborated and monitored at Eurostat. The German contribution to EUROMOD is based on the EMSD, provided by Eurostat, in which national data has been harmonized. This was the only source of micro data that has been utilized for the development of the German contribution to EUROMOD. There was no possibility for the national developer team to get any access to the national German SILC data (before harmonization) at the German statistical office at all.

The newest release of EUROMOD has been prepared for one input dataset based on EU-SILC 2022.

First, we describe the main features of the dataset based on EU-SILC 2022. Some major facts about the data base are summarized in Table 3.1.1. The period of collection was February 2022 to July 2022. The reference period, over which households reported incomes and employment status, was the entire year 2021. For other information, such as social status, household composition, or living conditions, the reference period is the timing of the interview. As a result, the UDB data base consists of 65,893 individuals, living in 32,906 households.

Table 3.1.1 EUROMOD database description (based on EU-SILC 2022)

EUROMOD database	DE_2022_b1
Original name	UDB (C22_release_23-09)
Provider	Eurostat
Year of collection	2022
Period of collection	February 2022 to July 2022
Income reference period	Year 2021
Sampling	Stratified area sample
Unit of assessment	Individuals aged 16 and older, living in private households in Germany
Coverage	Private households[1]
Sample size	65,893 individuals in 32,906 households
Non-Response rate	14.3% for the overall sample (household level)

Notes: [1] This covers the entire population living in private households in Germany, except for people in institutions, i.e. for example soldiers living in military caserns, or old people living in nursing homes. Children born after the income reference period were dropped from the initial sample (173 in total).

3.2 Data adjustment

The data have been cleared up such that within household relations are coherent, i.e. assuring that young children are not living on their own and that family relations are consistent. Variables for the identification number of the person, of the household, and if applicable of the mother and the father in the household have been adjusted accordingly. However, these adjustments were only of minor relevance in case of Germany.

For reasons of consistency between demographic variables at the time of the interview and income variables that refer to the previous year, age has been assigned at the beginning of the interview year. As a consequence, children born after the income reference year and before the interview have been excluded from the data set. In the input dataset based on EU-SILC 2021, this drops 127 individual observations but leaves the number of households unaffected.

3.3 Imputations and assumptions

In this section, the reference time period is described, the relation between gross and net incomes is explained. In addition, disaggregation techniques applied to disentangle harmonized UDB benefit data are described, an approach of approximation of the benefit entitlement basis for contributory benefits is illustrated, and the imputation of housing costs, as well as other imputed variables is briefly addressed.

3.3.1 Time period

The time over which the micro data for EU-SILC has been collected was February 2022 to July 2022.

Demographic information has been reported with reference to the time of the interview. This refers to information at the individual level, such as marital status, social status, and education, as well as at the household level, such as tenure status, household composition, and living conditions. For reasons of consistency between demographic variables at the time of the interview and income variables referring to the previous year, age has been assigned at the beginning of the interview year.

The reference period over which households reported incomes was in both cases the entire previous year (i.e. year 2021 for SILC 2022). This relates to any monetary information, on income from all sorts of sources (employment income, retirement income, capital income, private transfers, and social benefits), as well as any expenditures reported (taxes on income and social security contributions and expenditures for housing).

The reference period for labour market information is two-fold. There is information that refers to the time of the interview, such as number of hours usually worked per week in the main job, if the person is actively looking for a job, if the person has ever worked before, the person's current employment status, as well as the type of occupation, the position in the job, and the industry of employment. Then there is information that refers to the income reference period, i.e. the entire previous year, such as employment activity by month, reported in the number of months spent in full-time work, part-time work, unemployment, retirement, studying, or inactivity. Then there is information that refers to a longer period, such as the number of months ever spent in work (as an employee or self-employed), which has been reported as of the time of the interview and which refers to the entire working life.

All monetary information on incomes and expenditures has been converted into monthly averages in EUROMOD, regardless of the actual number of months of receipt. This means that, as the reference period usually is the entire previous year, incomes and expenditures have been assumed to be received, respectively paid, continuously and at the same rate throughout the entire year. No additional information on the number of times a particular income or benefit has been received throughout the year could have been exploited.

3.3.2 Gross incomes

The UDB data for Germany contain information about the sum of direct taxes and social security contributions paid during the income reference period (*tis*). This includes, for the direct taxes, personal income taxes, payroll taxes, church taxes, and solidarity surcharge. For the social security contributions, it includes contributions to statutory pension insurance, statutory and private health insurance, statutory and private long-term care insurance, and unemployment insurance. There is no single information on any of these components available in the data.

For most of the income variables, there is only information on the pre-tax values available in the SILC data for Germany. Respective net variables are either empty or identical to the gross variable. Only in case of several social benefits at the individual level (PY090, PY100, PY110, PY120, PY130), for some observations, the net variables are filled in and differ from respective gross variables. For these observations, a gross-to-net conversion has been undertaken, i.e. taxes and social security contributions have been imputed. However, in EUROMOD simulations, only gross (pre-tax) information is applied, no net variables are used. Also, the aggregate information on taxes and social contributions paid (*tis*) is only used for validation of EUROMOD simulations, but it is not used in the simulations and does not affect them.

3.3.3 Disaggregation of harmonized variables

In the framework of the UDB data, information on individual-/household-level benefit receipt and amounts has been aggregated to broader benefit categories for the sake of harmonization across countries. For Germany, this aggregate UDB data from Eurostat was the only source of micro data that could have been used for simulation. There has been no possibility to validate disaggregation or simulation effort with the national data (before harmonization) at all.

However, in order to simulate policies of the single social benefits, individual-/household-level information on receipt and amounts of the single benefits is indispensable. Therefore, the disaggregation procedure is explained next.

Disaggregation of input dataset based on EU-SILC 2022

The disaggregation of benefits in the input database from 2016 on differs substantially from the disaggregation carried out for older datasets (including EU-SILC 2015 and older ones). The reason is twofold. More recent EU-SILC data sets include (roughly) disaggregated benefit variables according to the concepts '(non-)contributory' and '(non-)means-tested'. Starting with EU-SILC 2016, the national team has received information from EUROSTAT regarding which benefits are included in which EU-SILC disaggregated variables. The following table summarizes the detailed benefit disaggregation that is used in the EUROMOD newest input dataset:

Table 3.2 Disaggregation of Harmonized Benefit Data

EUROMOD variable	EU-SILC variable	COMMENTS
Old-age benefits		
poa00	PY102	Further disaggregation needed, as PY102 includes other old-age benefits
poacs	PY104	Directly identified in EU-SILC
poapu	PY102	Further disaggregation needed, as PY102 includes other old-age benefits
poaps	PY102	Further disaggregation needed, as PY102 includes other old-age benefits
poass	PY102	Further disaggregation needed, as PY102 includes other old-age benefits
poaab	PY100	Variable not disaggregated in EU-SILC; identified as the residual not contained in PY101-PY104
poadi	PY102	Further disaggregation needed, as PY102 includes other old-age benefits
poawr	PY103	Directly identified in EU-SILC
byr	PY100	Variable not disaggregated in EU-SILC; identified as the residual not contained in PY101-PY104
Disability benefits		
pdiss	PY132	Further disaggregation needed, as PY132 also includes *pdica*
pdi00	PY131	Directly identified in EU-SILC
pdica	PY132	Further disaggregation needed, as PY132 also includes *pdiss*
pdiwr	PY133	Directly identified in EU-SILC
pdiot	PY134	Directly identified in EU-SILC
Sickness benefits		
bhl	PY121 PY122	No disaggregation required
Unemployment benefits		

bunct	PY092	Further disaggregation needed, as PY092 also includes *ysv*
bunnc	PY093	Further disaggregation needed, as PY093 also includes *buntr*
bunot	PY091	Directly identified in EU-SILC
ysv	PY092	Further disaggregation needed, as PY092 also includes *bunct*
buntr	PY093	Further disaggregation needed, as PY093 also includes *bunnc*
bunls	PY090	Variable not disaggregated in EU-SILC; identified as the residual not contained in PY091-PY094
Family benefits		
bch00	HY054	Further disaggregation needed, as HY054 also includes bfaot, bmact and bcham
bchot	HY053	Further disaggregation needed, as HY053 also includes bplct and bched
bched	HY053	Further disaggregation needed, as HY053 also includes bchot and bplct
bmact	HY052 & HY054	Further disaggregation needed, as HY054 also includes bch00, bfaot and bcham
bplct	HY053	Further disaggregation needed, as HY053 also includes bchot and bched
bcham	HY054	Further disaggregation needed, as HY054 also includes bch00, bmact and bfaot
bfaot	HY054	Further disaggregation needed, as HY054 also includes bch00, bmact and bcham
Social assistance		
bsaoa	HY063	Further disaggregation needed, as HY063 also includes other social assistance benefits
bsa00	HY063	Further disaggregation needed, as HY063 also includes other social assistance benefits
bsaot	HY063	Further disaggregation needed, as HY063 also includes other social assistance benefits
bsa01	HY061	Directly identified in EU-SILC
bsapu	HY060	Variable not disaggregated in EU-SILC; identified as the residual not contained in HY061-HY064
Housing benefits		
bho00	HY073	Further disaggregation needed, as HY073 also includes bhoot.
bhoot	HY073	Further disaggregation needed, as HY073 also includes bho00.

For those variables requiring further disaggregation, information on the actual policies have been used. Generally, the procedure was to infer eligibility and benefit amounts from observed information on individual/household characteristics, current activity, and receipt of aggregate benefits. Eligibility and amounts have to be assigned, while only receipt and amount of the broader aggregate benefits is known. This has generally been done with the help of observed information on individual characteristics (like age, gender, marital status, and health status), on current activity (months spent in retirement, work, unemployment, and education), on employment (employment status, industry, weekly hours worked, search activity, employment income), on household characteristics (household composition, presence and number of children), on benefit receipt for aggregate benefits, on benefit regulations (eligibility, rates, and maximum and minimum amounts), and on the little that is known on work history (months ever in work).

However, in many cases, this observed information was not sufficient to determine eligibility and amounts perfectly. In these cases, we generally proceeded following two approaches, often in a

combination of the two: 1) assigning aggregate benefits to exactly one of the disaggregated benefits, in case this was possible, assuming only one of the aggregate benefits is received at a time. However, this assumption can well be violated so that some error is inevitable with this approach. But often this was the only possible approach when benefits depend on (unobserved) contributions. 2) Where possible, eligibility and amounts of disaggregated benefits have been determined directly, i.e. by inferring from observed information, or say imputing the benefit. These approaches shall be clarified in the following when disaggregation procedures are described in detail for the single aggregate benefit categories.

For income from employment (*yem*), there has been no need to disaggregate because none of the single components has been simulated. Income from employment consists of the single components: wages and salary from main and second jobs, severance pay from last job, 13th and 14th month wages, Christmas bonuses, holiday payments, profit sharing, other special incomes, bonuses to cover work-related travel expenses related to public transport, and military or civil service payments.

Similarly, there has been no need for disaggregation at income from rent (*ypr*), which only consists of income from rental of a property or land, and at income from capital (*yiy*), which only consists of income from interest, dividends, or profit from capital investments in unincorporated business. This means that these incomes have been treated as compound incomes in the simulations. This is relevant for income from rent at personal income taxation (policies *tin_de*, *tinit_de*, *tinjt_de*), where it has been assumed that this income is entirely taxable under income from rent. Similarly, income from capital has been assumed at income taxation to be entirely taxable, apart from any allowances for capital income, where applicable.

Unemployment benefits (EUROMOD variable *bun*) have been disaggregated into six components by the following procedure.

- Firstly, the observed benefit amount in the SILC variable PY093 is assigned to "citizen's benefit (ALG II)" (EUROMOD variable bunnc), up to the maximum legislated amount in 2016. Any amount above the maximum is assigned to "benefits for re-training" (EUROMOD variable buntr).
- Secondly, the observed benefit amount in the SILC variable PY092 is assigned to "unemployment benefits I (ALG I)" (EUROMOD variable bunct) as long as the respective individual reports to have spent at least a month in unemployment. The observed benefit in PY092 is assigned to "severance payments" (EUROMOD variable ysv) if the individual reporting non-zero amount in PY092 reports to have spent zero months in unemployment.
- Thirdly, the observed benefit amount in the SILC variable PY091 is assigned to "benefits for business start-ups" (EUROMOD variable bunot).
- Fourthly, the difference between i) all unemployment benefits reported in SILC variable PY090 (EUROMOD variable bun) and ii) the imputed unemployment benefits (bunnc, bunot, bunct, buntr, ysv) is assigned to "lump-sum unemployment benefits" (EUROMOD variable bunls).

Old-age pensions (EUROMOD variable *poa*) have been disaggregated into eight components by the following procedure:

- Firstly, the benefit amount reported in SILC variable PY104 is assigned to "old-age pensions for civil servants" (EUROMOD variable poacs).
- Secondly, the benefit amount reported in the SILC variable PY103 is assigned to "benefits for war victims" (EUROMOD variable poawr).
- Thirdly, the benefit amount reported in the SILC variable PY102 is disaggregated into several benefits: The benefit amount is assigned to "Disability pensions for those aged over 65, that include the Disability pension from stat. accident insurance" (EUROMOD

variable poadi) if the respective individual reports to have a disability and a non-zero amount in the SILC variable PY101. The amount reported in PY102 is assigned to "Pensions for employees in public service" (EUROMOD variable poapu) if poadi is zero for the respective individual and they report non-zero amount in the SILC variable PY104. The amount in PY102 is then assigned to "pensions for self-employed, farmers and freelancers" (EUROMOD variable poaps) if the individual has zero amount in poadi and poapu and fulfils one of the conditions: i) the individual reports to be a farmer, ii) the individual reports to be self-employed but not a farmer, iii) the individual reports non-zero amount in the SILC variable HY061.

- Fourthly, we calculate the difference between i) PY102 and ii) the sum of poadi, poapu and poaps. The sum of this difference and the amount reported in the SILC variable PY101 are assigned to "Old-age pensions from the statutory pension insurance" (EUROMOD variable poass), up to the maximum legislated amount in 2016. The amount above the maximum is then assigned to "Old-age pensions from employer schemes" (EUROMOD variable poa00).
- Finally, the difference between i) all old-age benefits reported in SILC variable PY100 (EUROMOD variable poa) and ii) the sum of old-age benefits in the SILC variables PY101, PY102, PY103 and PY104, is assigned to two benefits: 1) "old-age pensions from a foreign country" (EUROMOD variable poaab) if the individual is older than 65 and 2) "benefits for early retirement" (EUROMOD variable byr) if the individual is aged 65 or less.

Survivor pensions (EUROMOD variable *psu*) have been disaggregated into two components in the following way:

- The amount reported in the SILC variable PY110 (EUROMOD variable psu) are assigned to "orphaner's pension" (EUROMOD variable psuor) if the person is aged 18 or younger or aged 19 to 27 and not widowed.
- Remaining benefit amount is assigned to "widow(er)'s pension" (EUROMOD variable psuwd).

Disability benefits (EUROMOD variable *pdi*) have been disaggregated into five components by the following procedure:

- Firstly, the benefit amount reported in the SILC variable PY131 is assigned to "pensions for reduced ability to work" (EUROMOD variable pdi00).
- Second, the benefit amount reported in the SILC variable PY133 is assigned to "Benefits for war victims and burden sharing" (EUROMOD variable pdiwr).
- Third, the benefit amount reported in the SILC variable PY134 is assigned to "Pensions for disability to work for civil servants" (EUROMOD variable pdiot).
- Fourth, the benefit amount reported in the SILC variable PY132 is split into two benefits: 1) "Long-term care benefits from pension insurance" (EUROMOD variable pdica) up to the maximum legislated amount in 2016; 2) the difference between PY132 and pdica is assigned to "Disability pension from statutory accident insurance" (EUROMOD variable pdiss).

Family benefits (EUROMOD variable *bfa*):

- First, "maternity benefits" (EUROMOD variable bmact) are directly identified from SILC variable HY052.
- Then, we proceed to disaggregate SILC variable HY054. To this end, we first impute the month of birth of children aged 0 by checking if the amount recorded in SILC variable HY054 coincides with child benefits being paid for a certain number of months. The result of this check indicates the month of birth of most children aged 0. This information

is useful for the disaggregation of most family benefits reported by households with children aged 0.

- Thirdly, "child benefits" (EUROMOD variable bch00) are identified from SILC variable HY054 (for those aged 0, taking into account the imputed month of birth), as child benefits are an (almost) universal benefit.
- Fourth, the second component of "maternity benefits" (EUROMOD variable bmact) is identified from what remains from SILC variable HY054 for households with children aged 0.
- Then, we simulate eligibility criteria for the receipt of "alimony payments" (EUROMOD variable bcham) and identify them from the remainder of SILC variable HY054.
- Any remaining amount in SILC variable HY054, which has not been allocated to any of the three benefits above, is assigned to "family benefits: other: care allowance" (EUROMOD variable bfaot).
- Next, we proceed to disaggregate SILC variable HY053. For families with children aged 0 and/or 1, which do not report receipt of housing benefits or social assistance benefits, we classify any amount reported in SILC variable HY053 as parental benefits (EUROMOD variable bplct). For those families with children aged 0 or 1, who report receipt of housing benefits, we assign them the minimum amount of parental benefits from SILC variable HY053 and the rest is allocated to "additional child benefits" (EUROMOD variable bchot).
- Then, we simulate the maximum possible additional child benefits for families whose children are aged 2 and older and assign any remaining amount in variable HY053 to "additional child benefits", as long as this does not exceed the simulated amount.
- Next, we identify "children benefits: educational allowance" (EUROMOD variable bched) as the remainder of SILC variable HY053 for those families reporting receipt of unemployment benefits II, housing benefits or social assistance.
- Finally, adjustments to make ends meet are made on "parental benefits".

Social assistance benefits (EUROMOD variable *bsa*) have been disaggregated into five components by the following procedure:

- Firstly, the amount reported in SILC variable HY061 is identified as "social assistance: pension for agriculture" (EUROMOD variable bsa01).
- Secondly, "social assistance: charities" (EUROMOD variable bsapu) is identified as the observed amounts listed in SILC variable HY060 which are not listed in any of these SILC variables (HY061, HY062, HY063, HY064).
- Thirdly, the amount reported in SILC variable HY063 is split into three social assistance benefits, namely EUROMOD variables bsaoa, bsaot and bsa00. In order to do so, SILC variable HY063 is identified as "social assistance: old-age" (EUROMOD variable bsaoa) if households reporting positive values include members aged 65 or older and/or members with disabilities. Then, remaining amounts of HY063 are allocated to "social assistance: social benefits" (EUROMOD variable bsaot) if there are children living in the households. Finally, any remaining positive value of HY063 is allocated to "basic social assistance" (EUROMOD variable bsa00).

Housing benefits (EUROMOD variable *bho*) have been disaggregated into two components in the following way:

- Firstly, the benefit amount reported in the SILC variable HY073 is assigned to "other housing benefits" (EUROMOD variable bhoot) for all households who report being recipients of unemployment assistance or social assistance.
- The remaining benefit amount reported in SILC variable HY073 is assigned to "basic housing benefits" (EUROMOD variable bho00).

Survivor benefits (EUROMOD variable *psu*) have been disaggregated into two components, namely "survivor benefits: widows" (*psuwd*) and "survivor benefits: orphans" (*psuor*).

3.3.4 Approximation of Benefit Entitlement Basis

The benefit entitlement basis is essential for simulations of benefit receipt and amounts in the framework of EUROMOD. For most of the contributory benefits that have been simulated, the benefit entitlement basis is some past, usually pre-spell income, often the after-social-contributions income from employment. The problem for the simulations is that past income from employment is not observed. But this information can be inferred from benefit receipt under certain conditions. An attempt in this direction has been made in order to be able to simulate any contributory benefits at all.

For contributory benefits, the benefit function can be inverted to infer the entitlement basis if all parameters of the function, except for the entitlement basis, are known. This does not hold for most pensions, as for pensions both the income level, on which contributions have been made, and the duration of contributions are unknown. As a consequence, this procedure has not been applied to any old-age pensions. However, for most other contributory benefits, the duration of contributions is not so important, and only the income level needs to be approximated. In this case, inversion of the benefit function yields a proxy for the necessary information.

This procedure can, of course, only be applied for individuals for whom a spell is observed, because otherwise benefit receipt is unobserved, so that the benefit amount is also unknown, and thus more than one parameter of the benefit function is unknown. However, as for most of the contributory benefits that have been simulated the entitlement basis is very similar (pre-spell after-social-contributions income from employment), an average of all approximated bases, over all contributory benefits, can be generated, and thereby a proxy for the entitlement basis results, also for individuals who are not in receipt of a specific contributory benefit, if they are in receipt of any simulated contributory benefit.

Contributory benefits that contribute to the generation of this proxy are: unemployment benefits I, sickness benefits from statutory health insurance, sickness benefits from private health insurance, long-term care benefits from statutory accident insurance, parental-leave benefits, and disability pensions from statutory accident insurance.

For unemployment benefits I, the number of months benefits were received has been considered. The benefit function has been differentiated by individuals with kids and without kids, and by individuals earning additional income from employment. For the latter group, it has also been considered that they are only allowed to earn additional income up to a threshold. The relevant income for this threshold considers taxes and social security contributions paid, as well as a lump-sum allowance for earnings-related expenses.

For sickness benefits from statutory health insurance, sickness benefits from private health insurance, long-term care benefits from statutory accident insurance, parental-leave benefits, and disability pensions from statutory accident insurance, the benefit function has been simply inverted, conditional on benefit receipt.

An average over all approximated benefit bases has been generated, at the individual level. For those individuals who report "employee", but for whom the proxy evaluates to zero because they are not in receipt of any of the contributory benefits, current earnings, deflated from 2018 to 2017 (for the input dataset based on EU-SILC 2018) by the growth rate of employee income from national accounts, have been applied. This has also been done for individuals with a zero proxy who do not report "employee", but who earn positive income from employment. For those with

zeros who do not report "employee" and who earn zero income from employment, estimated wages (*yivwg*) and current hours (*lhw*) have been applied.

3.3.5 Imputation of Tax Deductions/Allowances

From EUROMOD release H2.0+ onwards, tax deductions and allowances have no longer been imputed but simulated within the income tax policy (see Section 2.8.1 of this report). For the documentation of these old imputations, please refer to older versions of the EUROMOD Country Report for Germany.[15]

3.3.6 Other Imputed Variables

Housing expenditures (EUROMOD variable *xhcrt*) have no longer been imputed from EUROMOD version H2.0+ onwards (i.e. the original EU-SILC values of xhcrt are used).

Holdings of financial assets (EUROMOD variable *afc*) have been imputed, inferring them from the observed income from capital (*yiy*). It has been assumed that income from capital has been received as an average rate of return on the stock of financial assets. As a proxy for this rate of return, an average interest rate has been applied. This is the annual average of monthly rates for the year 2019 (EU-SILC 2020) of the interest rate on deposits for households, with maturity of 1-2 years.[16] It evaluates to 0.29% in 2019. Inverting the rate of return function, applying the calibration for the rate, returns the stock of financial assets, on average for the year 2019.

Regional information on residence is missing in the German EMSD (DB040). There has been no possibility to apply any other information that was helpful to impute the missing regional information. As a result, no imputation for the regional information has been implemented.

3.4 Updating

To account for any time inconsistencies between the input dataset and the policy year, updating factors are used. Each monetary variable (i.e. each income component) is updated so as to account for changes in the non-simulated variables that have taken place between the year of the data and the year of the simulated tax-benefit system. Updating factors are generally based on changes in the average value of an income component between the year of the data and the policy year. For detailed information about the construction of each updating factor as well as the sources that have been used, see Annex I.

As a rule, updating 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. Updating 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 3.5 in Annex I below.

[15] To access previous versions of EUROMOD Country Reports, see here: https://www.euromod.ac.uk/using-euromod/country-reports

[16] See ECB, MFI interest rates: http://sdw.ecb.europa.eu/browse.do?node=2018774.

3.5 Extended input data (with household expenditures for the simulation of consumption taxes)

For the simulation of consumption taxes, the model needs to be run with extended EUROMOD input files. They consist of the core EUROMOD input files based on EU-SILC or National SILC, extended with new variables (household-level income shares of expenditures by product) imputed from EU/National-HBS. The semi-parametric method implemented for the imputation follows the methodology developed by Akoğuz et al (2020).

Table 3.2 summarizes the major features of the most recent database used to be run with the policy systems of 2021-2024.

Table 3.2 Extended EUROMOD database description

Extended EUROMOD database for the simulation of consumption taxes	SILC 2022 – Income year 2021 – Expenditures from HBS 2015 (COICOP 2003)
EUROMOD database	DE_2022_b1_2015_03_e2
Year of collection (HBS) and source	HBS 2015 – EU
Year of collection (SILC) and source	SILC 2022 – EU
Coverage and sample size	32,906 households (65,893 individuals)
Share of households with negative incomes excluded from the matching procedure	0.1%

These extended EUROMOD files contain all the variables included in the standard EUROMOD input files plus the income shares of each consumption category included in HBS. For example, for countries with consumption disaggregation at 4 COICOP level (5 digits), there will be close to 200 additional variables, each one with the income shares of expenditure (household level) for that particular consumption category (e.g. starting from the income share of rice consumption: xs01111; bread: xs01112, and so on and so forth). The number of additional variables depends on the granularity available in HBS, and it varies across countries).

For the case of Germany, data DE_2022_b1_2015_03_e2, the number of variables included (income shares of expenditures, xs_c*) are 122, corresponding to the harmonized consumption categories defined at COICOP [2003] level 4 (five digits).

Please note that, due to the lack of information in the HBS files distributed by Eurostat, there is no consumption reported at 5-digit COICOP level for the following 3-digit codes: CP044, CP101, CP102, CP103, CP104. Positive consumption might exist for 3-digit or 4-digit levels, but EUROMOD uses only 5-digit values.

This database is an extension of the core EUROMOD input database, and so it is based on the same sample (i.e., same identifiers "idperson" and "idhh" to identify persons and households, respectively) and contains the same variables plus the income shares of expenditure (xs_* variables).

In Table 3.3 we present the share of households' consumption expenditures by product (and total) captured in our matched databases (extended EM input files) with respect to the original reported expenditures in HBS. The column that refers to the same year (in this case, HBS 2015 with Extended EM Input 2015) directly depends on the quality of the imputation procedure, while the comparison across different years is influenced not only by the matching noise but also by the

changes in population characteristics and in the underlining distribution of income. Therefore, the coverage displayed in the second column is just informative but is not and should not be used to evaluate nor validate the imputation procedure.

Information on the coverage of these simulated expenditures (coming from the imputation of HBS 2015 to more recent SILC-based data) with respect to the expenditures reported by National Accounts is included in section 4 of this report, together with the other macro-validation results.

Below we summarize the main findings from the imputation validation checks for Germany.

Table 3.3. Expenditure coverage of Extended EM Input files

COICOP group	HBS 2015 – Extended EM Input 2015	HBS 2015 – Extended EM Input 2022
1	106.8	112.8
2	108.0	115.3
3	104.8	102.4
4	103.6	94.8
5	97.8	95.7
6	132.0	108.5
7	107.5	112.1
8	106.4	116.4
9	95.8	110.6
10	52.5	27.6
11	117.9	106.3
12	103.8	137.8

4. VALIDATION OF INPUT DATASET BASED ON EU-SILC 2022

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 the Annex. Both market incomes and non-simulated taxes and benefits in the input dataset as well as simulated taxes and benefits are validated against external official data. The main discrepancies between EUROMOD results and external benchmarks are discussed in the following subsections. Factors that may explain the observed differences are also discussed.

4.1.1 Components of disposable income

There are no major differences between the definitions of disposable income in EUROMOD and in the EU-SILC data (see

Table **4.1**). Almost all income components listed in

Table **4.1** are included in both income concepts. However, there are some exceptions. Disposable income in EUROMOD does not include fringe benefits (*kfb*), such as for example company cars, while the EU-SILC concept does include them. In addition, one off-payments in the context of the energy crisis in 2022 have been added to the 2022 and, if applicable, 2023 policy year. They cannot be part of disposable income for the latest SILC wave with income reference year 2021, with exception of the child bonus in 2021, whose simulation was switched off in 2021.

Note moreover that some variables listed for the EUROMOD concept in

Table **4.1** are aggregate variables. That means they have been harmonized for the UDB micro data set and have been disaggregated again by the national team in the context of the EUROMOD simulations (also see Section 3.3.3 for more details). As a consequence, they consist of several income components, some of which have been simulated in EUROMOD and some not. These variables are income from private pension plans (*il_ppen*), old-age pensions (*poa*), disability pensions (*pdi*), unemployment benefits (*bun*), family benefits (*bfa*) and social assistance (*bsa*).

In

Table **4.1**, these variables are only listed in its aggregate form and the single income components are left out. Income taxes and social security contributions are only observed as a total in EU-

SILC (variable *HY140G*). In EUROMOD, however, income taxes are simulated for income in general (*tin*) and income from capital (*tinkt*). Social security contributions are also simulated and broken down by social status, yielding separate simulated figures of social security contributions for employees (*ils_sicee*), for self-employed individuals (*ils_sicse*) and for pensioners (*ils_sicpe*). Repayments/receipts for tax adjustments (*HY145N*) as well as regular taxes on wealth (*tpr*) are observed in EU-SILC, while they have not been simulated in EUROMOD.

The composition of disposable household income in EUROMOD does change over the policy years 2021 to 2024. In 2022 the energy related one-off payments have been included to provide a more realistic picture of disposable income for the year 2022. In 2023, only the one-off payment for students and the second heating bonus are included.

Table 4.1 Components of disposable income

	EUROMOD [2021-2024]	German EU-SILC 2022 [income year 2021]
	ils_dispy	HY020
Employee cash or near cash income	+	+
Employer's social insurance contribution	+	n/a
Company car	n/a	+
Contributions to individual private pension plans	+	+
Cash benefits or losses from self-employment	+	+
Pension from individual private plans	+	+
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	n/a	-
Energy-related lump sum transfer (employer, pensioners, students)	+	n/a
Heating bonus	+	n/a
Child bonus	+	+
Regular inter-household cash transfer paid	-	-
Tax on income and social contributions	-	-
Repayments/receipts for tax adjustment	n/a	-
Contributions to private health insurance [self-employed]	-	n/a

Notes: Some variables in EUROMOD (namely poa, pdi, bun, bfa, bsa, bho) are aggregated variables. They consist of several components, some of which have been simulated in EUROMOD and some not.
Source: For EU-SILC, Eurostat (2022) – EU-SILC 065 (2022 operation) – Description of Target Variables: Cross-sectional and longitudinal, 2022 operation v4.

4.1.2 Validation of market income

The components of market income in EU-SILC data shall be validated with respect to the number of recipients as well as the aggregated total incomes received in the population in a year. Table A3.1 in the Annex tabulates the number of recipients for each component of market income, as it has been defined in EU-SILC for 2021 and compares it to figures from external statistics. As all the components of market income have not been simulated in EUROMOD, the number of recipients remains constant throughout all simulated years. Thus, the number of recipients for the input database is only displayed for 2020 in Table A3.1.

The sum of all components of market income, minus expenditures for alimony payments (*xmp*) and expense for private health insurance (*xhi_s*) is defined to be "original (market) income" in EUROMOD, from which the largest part comes from income from employment. The number of individuals receiving positive income from employment (*yem*) in 2020 is lower in EU-SILC

(39.694 Mil.) than in external figures from the National Accounts (40.763 Mil.). Unfortunately, both figures are only partially comparable, as EU-SILC reports all individuals who have received income from employment whereas the National Accounts reports a yearly average. Therefore, one can conclude that EU-SILC possibly represents an accurate number of individuals with positive income from dependent employment. For income from self-employment (*yse*), the number of recipients in EU-SILC fits well to the external statistics.

The respective aggregate amounts for the components of market income are displayed in Table A3.2. The figures for the aggregate amount for dependent employment income (*yem)* sums up to 1,630bn Euro in 2021. This figure matches quite well the corresponding number from external sources (1,616bn), which in this case are National Accounts. The ratio for this variable also remains quite close to one for the years it has been uprated.

Unfortunately, it is not possible to validate the aggregate income from self-employment (*yse*), since national accounts report income from self-employment as well as capital- and property income jointly.

4.1.3 Validation of taxes and social insurance contributions

In this section, results from EUROMOD of taxes and social insurance contributions are presented and validated in terms of numbers of recipients and aggregated amounts against external data. Apart from the property tax (*tpr)*, all taxes and social insurance contributions have been simulated.

Table A3.3 displays the numbers of taxpayers and contributors as simulated. No external data on the number of contributors for the years 2021 to 2024 could be found, except for social security contributions paid by employees (*ils_sicee)*, where EUROMOD slightly overestimates the number of contributors with a ratio ranging 102 % to 105 %. In the EU-SILC data for 2021, about 48m households pay regular income taxes (*tin*). Although not having any data for 2021 this figure is about 5m higher compared to the latest available data from 2020.

Aggregate amounts of simulated taxes and social security contributions are compared to external figures in Table A3.4. External information from national accounts has been utilised to validate the simulated social security payments. Employees' social contributions have been over-simulated with increasing accuracy over the years, which mainly stems from an over-estimation of health insurance contributions. Employer's social security contributions have been simulated more accurately (ratio of 105%) with unemployment insurance contributions being the most precise branch. Social contributions made by self-employed individuals are substantially over-estimated despite of the relatively accurate number of individuals receiving self-employment income which is probably due to the simplified simulation of contributions by self-employed, especially for statutory pension insurance contributions.

There is less information available for taxes[17] especially in the manner that the revenue simulated by EUROMOD can be compared to official statistics. The external cash-based figures comprise the payroll tax on wages, the assessed income tax as well as the respective solidarity surcharge on those taxes, which is consistent to the EUROMOD simulation. For 2021, the revenue from income tax (*tin_s*) simulated by EUROMOD is nearly equivalent to the external statistics with an accuracy of 101 %.

4.1.4 Validation of Benefits

The macro validation of simulated benefits is divided into pension benefits, means-tested and non-means-tested benefits. We compare simulated as well as non-simulated benefits, whose

[17] For details on the imputation of tax allowances, please see section 3.3.5.

values have been taken directly from the input data. It is important to note that many of the non-simulated variables are the result of the disaggregation carried out by the national team (for more methodological details, see Section 3.3.3). It should be therefore further noted, that any discrepancies in the number of recipients/aggregate spending estimated with EUROMOD (i.e. EU-SILC) vs based on official statistics can be attributed to both measurement error in the EU-SILC data as well as measurement error in the benefit disaggregation method. The respective numbers of recipients are displayed in Table A3.5.

From the pension benefits only the disability pension from statutory accident insurance has been simulated, unfortunately with low accuracy. The number of recipients of the most relevant type of pension, the old-age pension from statutory pension insurance (*poass*), from EU-SILC does not match the external data very precise with accuracy below 90 %, similar to pensions for individuals with reduced ability to work (*pdi00*). In contrast, the number of recipients of civil servants' pensions (*poacs*) from external data corresponds more or less those from EU-SILC.

Among the means-tested benefits, only minor ones have not been simulated, and for those no external sources could be found. The number of recipients of the other means-tested benefits has been validated against external sources, mostly with data from the Federal Employment Agency or from the National Statistical Office. The most relevant means-tested benefit, citizen's benefit (*bunnc)* has been over-estimated with respect to the number of its recipients in all years (ratio between 124 % and 144%). The number of recipients of housing benefits (*bho00)* or additional child benefits (*bchot)* have been extensively over-simulated. These benefits typically suffer from substantial non-take up in reality. For all these benefits benefit take-up adjustments are available. This is of special interest for the policy year 2023 as eligibility of housing benefits have been significantly widened. Another important means-tested benefit, old-age social assistance (*bsaoa_s*), has a lower number of recipients in EUROMOD than in external sources (ratio of 84% in 2021). It is important to note that the numbers of these benefits represent households not individuals as in the case of all other benefits and taxes. In addition to these benefits, recipients of education benefits (*bed*) have been heavily over-simulated.

Turning to the non-means tested benefits, only about half of them are simulated. For the most important benefit, child benefits (*bch00),* the simulated number of recipients is only slightly under-estimated (ratio of 94% in 2021), while simulated recipients of unemployment benefits are much less than the simulation suggest (ratio of 76% in 2021). The third simulated non-means-tested benefit, for which external data is available, is the parental leave benefit (*bplct),* for which the number of the recipients is also under-estimated (ratio of 69% in 2021). In case of the non-simulated non-means tested benefits, benefits for business start-ups (*bunot)* whereas benefits for retraining (*buntr*) appear to be substantially over-represented. The number of recipients of severance payments in 2020 fits quite well the external, but for the following it is much higher, as short-time work compensation was mostly present during the first two years of the COVID19 pandemic 2020 and 2021.

Aggregate amounts for benefits are compared between EU-SILC and external sources in Table A3.6. Euro received over an entire year by the whole population of benefit recipients are displayed. There is a little bit more information available on total sums paid for these benefits in external data, compared to the number of recipients. Often official statistics report aggregate amounts paid for particular benefits (e.g. in the official budget), but they do not state the number of individuals or households receiving it.

Most pension components appear to be under-represented in the input dataset with the exception of old-age benefits from the statutory pension insurance (*poass*), by far the largest old-age benefit, which is slightly over-estimated (ratio between 105 % and 107 %). Amounts from civil servant pensions (*poacs*) match the external statistics even better. Larger discrepancies can be found in pensions for reduced work ability (*poapu*) and pensions from employer schemes (*poa00*) that are

likely to be driven by the disaggregation of pension benefits which are carried out by the national team. Unfortunately, the five types of pensions *poass, poa00, poaps, poapu* and *poaab* have been disaggregated from a single EU-SILC variable. Therefore, it is difficult to achieve better disaggregation results without further information on labour market biographies. The aggregate amount of the major simulated disability benefit from the statutory accident insurance (*pdiss_s*) cannot be truly validated against external statistics because the simulated amount concerns uniquely those below the age of 65 and there is no comparable external statistic that considers this age threshold. However, just as an indication that the simulation is reasonable, Table A3.6. includes the external figure corresponding to all disability benefits from the statutory accident insurance and one can see that, as expected, the simulated aggregated amount is substantially smaller than the official statistics, but the difference corresponds to the difference in recipients seen in Table A3.5.

In contrast to the number of recipients, aggregate amounts for unemployment benefit II/citizen's benefit are simulated quite precisely (ratio of 98 % in 2021). Other social assistance (*bsaot_de*), which is mainly the benefit payments to children of recipients of *bunnc_de*, matches also quite well to external statistics. With regards to the other components of minimum income schemes general social assistance is strongly under-estimated in EUROMOD compared to external sources. Note that the external sources comprise benefits for refugees, that are probably underrepresented in SILC. For the other important means-tested benefits, like education benefits, housing benefits and additional child benefits, aggregate amounts are strongly over-estimated, probably due to non-take up issues.

Concerning the most important non-means tested benefit in terms of aggregate spending, namely the child benefits (*bch00*), simulated amounts match sufficiently external official statistics (ratio of 84% for 2021). For the minor family benefits, sums deviate somewhat between simulations and external data. Maternity benefits (*bmact_s*) still appear to be quite precisely simulated (ratio of 96 % with respect to the external figure). However, aggregate sums of parental-leave benefits (*bplct*) are strongly under-simulated (ratio of 36 %). This has probably to do with the fact that the benefit is calculated on imputed previous earnings of the recipients, as we observe these differences for most contributory benefits. The other non-means tested benefits, particularly unemployment benefits (*bunct*) and sickness benefits (*bhl)*, but also for benefits for retraining (*buntr*) have been under-simulated. As in case of the numbers of recipients, the amounts for short-time work schemes influence heavily the numbers of severance payments (*ysv*).

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 security contributions. The weights in the OECD scale are: first adult=1; additional people aged 14+ =0.5; additional people aged under 14=0.3.

4.2.1 Income inequality

The distribution of equivalised disposable household income is presented in Table A3.7 in the Annex as income shares hold by income deciles. Simulated incomes for the four policy years (EUROMOD) are compared to external data, for which ratios of coverage are tabulated. The external source for the decile income shares is Eurostat statistics.

EUROMOD over-simulates the income share of the lowest decile in 2020, where the ratio of the simulated to the external figure amounts to 121%. For the second to ninth decile of the distribution, with ratios of 99% to 102%, EUROMOD captures the coverage of the population

very accurately. The top decile is slightly underestimated with a base / external ratio of 95%. The reason for the high ratio in the first decile could be the over simulation of citizen's benefits, the most relevant benefit for low-income households. For 2021, no over-simulation of the income share of the first decile is found.

For the comparisons of the median, mean, Gini coefficient, and the inter-quantile ratio (S80/S20), external data again refers to official statistics from Eurostat. In terms of household disposable income, the median is closer to or exactly one than the mean (99% vs 96% in 2021). Gini coefficient and the inter-quantile ratio match nearly perfectly to the external data in 2021 and are only slightly lower in 2022.

4.2.2 Poverty rates

Poverty rates by gender and age are presented in Table A3.8. They are compared for the EUROMOD simulations with external data from Eurostat statistics. Their computation for the simulated data is based on the equivalised disposable household income that has already been analysed for its distribution in the previous section. Several definitions of poverty rates have been applied, always with respect to a share (40%, 50%, 60% or 70%) of the median income in the population. Poverty rates are differentiated by gender, and for the usual 60%-definitions they are presented separately for age groups. Results for 2021 show that all poverty rates are rather well simulated compared to the external figures from Eurostat except for the 40% poverty threshold, where the share is substantially underestimated, possibly due to the over-simulation of some means-tested benefits. In 2022 all poverty rates are overestimated ranging from 103 % to 120 %, except for the 40% threshold, whose share is still undersimulated.

4.3 Macrovalidation of consumption taxes

Table A3.9 and A3.10 show the validation of the consumption taxes-related amounts. The top part of table A3.9 compares aggregated expenditure amounts from EUROMOD simulations with National Account (NA) external statistics as reported by EUROSTAT. For many COICOP level 1 categories, aggregated simulated values are relatively close to the external statistics (with ratios between 0.7 and 1.2). The notable exceptions are "02 Alcoholic beverages, tobacco, etc." (ratio 0.44), "05 Furnishings, household equipment, etc." (ratio 0.55), and especially "10 Education", where less than one fourth of expenditures are captured by EUROMOD as compared to the external statistics.

The comparison of simulated aggregated revenues (non-calibrated) from indirect taxes as compared to the external statistics show that VAT is undersimulated by half, while 60% of revenues from excises are captured in simulations. The most underestimated excise categories are tobacco and electricity (ratios 0.37 and 0.36 respectively).

These discrepancies might be related to the survey data. The consumption which is declared by households might differ from the actual one (e.g., misreporting of certain about how much they smoke and drink). Discrepancies might also occur due sampling (e.g., having sampled households who, on average, spend less on furnishing or household equipment as compared to the aggregate statistics).

To correct for this problem, EUROMOD provides also adjusted consumption aggregates, where the calibration/correcting factor is the ratio between NA aggregated expenditures and EM aggregated simulated expenditures level 1 at baseline. Effectively NA adjustment scales-up (or down) consumption and tax liabilities of all individuals.

Table A3.10 compares annual Government revenue from consumption taxes after applying calibration to NA. The top part shows total simulated consumption tax revenues for private

households after calibration. After calibration, the model captures around 60% of aggregate revenues from VAT and 80% from excises. Although the calibration improves the estimates for all categories (especially so for tobacco), excises from electricity are hardly changed showing a poor 0.37 ratio compared to the external statistics.

Among reasons for discrepancies, the most likely is that some groups which pay significant amounts of VAT and exercise are not covered in HBS. These might include not only private household not covered by HBS, but also the government and the third sector, hospitals and business enterprises such as financial companies that are themselves exempt from VAT but have to pay the input VAT from all previous production.

5. SUMMARY OF "HEALTH WARNINGS"

The model draws to a large extent on the disaggregation of harmonized variables (mostly benefits) described in Section 3.3.3. The fit of the disaggregated benefits is very good for some variables and rather poor for others. Fortunately, for input datasets based on EU-SILC 2016 and later datasets, the national team has received information on which benefits are contained under which SILC disaggregated benefit variables, which has improved the quality of the disaggregation procedure.

From this release onwards, tax allowances are no longer imputed but simulated within EUROMOD. A detailed description of the simulation of tax allowances can be found in Section 2.8.1 of this report. A description of the (old) imputed tax allowances is available in earlier versions of the Country Report for Germany.

In input datasets based on EU-SILC 2015 and older, early retirement benefit (byr) was disaggregated from unemployment benefits (bun). Thanks to new information provided by Eurostat, the early retirement benefit (byr) in the input dataset based on EU-SILC 2016 is identified as part of old-age benefits (poa).

Furthermore, the policy pdiac_de - and resulting variables *pdiac* and *pdiac_s* - have been dropped in the model. According to new information provided by Eurostat, EU-SILC does not contain information on this benefit.

In input datasets based on EU-SILC releases up to 2015, advances on alimony payments were disaggregated from social assistance benefits. Thanks to new information, we know that such benefits are classified in EU-SILC as family benefits. As a consequence, the benefit *bsaam* takes the name *bcham* from input dataset DE_2015_a* onwards.

In year 2020, the model includes the possibility of simulating Germany's most important wage compensating scheme (Kurzarbeit). This policy already existed before 2020 and information on these transfers are saved in variable ysv. The simulated version of the policy in 2020 has been named bwkmcee_s for harmonisation purposes.

The simulation of the wage compensation scheme (bwkmcee_de) is triggered by the simulation of labour market transitions defined in policy TransLMA_de. 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 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.

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ANNEX 1. UPRATING FACTORS

Table A1. Raw indices for deriving EUROMOD uprating factors

Index	Constant name	Years				Source	Income components uprated by the index
		2021	2022	2023	2024		
Consumer Price Index (2015=100)	$f_cpi	109.24	118.71	125.87	130.0	Eurostat; for 2024 indicator ZCPIH from DG ECFIN	yxy01 – yxy06, kfb, ypp, ysv, bunot, buntr, byr, bhl, bsaam, bsapu, bsaot, pdiot, pdiwr, poapu, poa00, poaps, poaps01, poaps02, poaab, tpr, tad, kivho, xmp, xpp, kfbcc, tinta*, all sim. ben.
Harmonized Consumer Price Index (2015 = 100)	$HICP	109.24	118.71	126.8	100	Eurostat; for 2024 indicator ZCPIH from DG ECFIN	
Average gross earnings; overall economy (EUR per year)	$f_yem0	29.28	30.53	32.39	34.11	National Statistical Office, National Accounts	yem
Average gross earnings; agriculture and fishing (EUR per year)	$f_yem1	14.63	15.30	16.57	17.45	National Statistical Office, National Accounts	yem
Average gross earnings; mining, manufacturing and utilities (EUR per year)	$f_yem2	34.43	35.98	38.51	40.55	National Statistical Office, National Accounts	yem
Average gross earnings; construction (EUR per year)	$f_yem3	25.69	27.16	28.60	30.12	National Statistical Office, National Accounts	yem
Average gross earnings; wholesale and retail trade (EUR per year)	$f_yem4	25.79	26.71	28.49	30.00	National Statistical Office, National Accounts	yem
Average gross earnings; hotels and restaurants (EUR per year)	$f_yem5	17.32	18.28	19.50	20.53	National Statistical Office, National Accounts	yem

Average gross earnings; transport and communication (EUR per year)	$f_yem6	31.61	32.97	35.32	37.20	National Accounts	Statistical	Office,	National	yem
Average gross earnings; financial intermediation (EUR per year)	$f_yem7	44.47	47.06	50.09	52.74	National Accounts	Statistical	Office,	National	yem
Average gross earnings; real state and business (EUR per year)	$f_yem8	29.62	31.19	33.00	34.75	National Accounts	Statistical	Office,	National	yem
Average gross earnings; public administration and defence (EUR per year)	$f_yem9	31.42	33.11	34.50	36.33	National Accounts	Statistical	Office,	National	yem
Average gross earnings; education (EUR per year)	$f_yem10	31.48	32.63	34.00	35.80	National Accounts	Statistical	Office,	National	yem
Average gross earnings; health and social work (EUR per year)	$f_yem11	24.53	25.74	26.82	28.24	National Accounts	Statistical	Office,	National	yem
Average gross earnings; other (EUR per year)	$f_yem12	23.54	24.21	25.41	26.76	National Accounts	Statistical	Office,	National	yem
Aggregated gross earnings; overall economy (billion EUR per year)	$f_yivwg0	29.28	30.53	32.39	34.11	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; agriculture and fishing (billion EUR per year)	$f_yivwg1	14.63	15.30	16.57	17.45	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; mining, manufacturing and utilities (billion EUR per year)	$f_yivwg2	34.43	35.98	38.51	40.55	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; construction (billion EUR per year)	$f_yivwg3	25.69	27.16	28.60	30.12	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; wholesale and retail trade (billion EUR per year)	$f_yivwg4	25.79	26.71	28.49	30.00	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; hotels and restaurants (billion EUR per year)	$f_yivwg5	17.32	18.28	19.50	20.53	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; transport and communication (billion EUR per year)	$f_yivwg6	31.61	32.97	35.32	37.20	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; financial intermediation (billion EUR per year)	$f_yivwg7	44.47	47.06	50.09	52.74	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; real state and business (billion EUR per year)	$f_yivwg8	29.62	31.19	33.00	34.75	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; public administration and defence (billion EUR per year)	$f_yivwg9	31.42	33.11	34.50	36.33	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; education (billion EUR per year)	$f_yivwg10	31.48	32.63	34.00	35.80	National Accounts	Statistical	Office,	National	yivwg

Aggregated gross earnings; health and social work (billion EUR per year)	$f_yivwg11	24.53	25.74	26.82	28.24	National Accounts	Statistical	Office,	National	yivwg
Aggregated gross earnings; other (billion EUR per year)	$f_yivwg12	23.54	24.21	25.41	26.76	National Accounts	Statistical	Office,	National	yivwg
Lagged average gross earnings; overall economy (EUR per year)	$f_yxy0	29.05	29.28	30.53	32.39	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; agriculture and fishing (EUR per year)	$f_yxy1	14.73	14.63	15.30	16.57	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; mining, manufacturing and utilities (EUR per year)	$f_yxy2	34.30	34.43	35.98	38.51	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; construction (EUR per year)	$f_yxy3	25.36	25.69	27.16	28.60	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; wholesale and retail trade (EUR per year)	$f_yxy4	25.57	25.79	26.71	28.49	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; hotels and restaurants (EUR per year)	$f_yxy5	16.75	17.32	18.28	19.50	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; transport and communication (EUR per year)	$f_yxy6	30.98	31.61	32.97	35.32	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; financial intermediation (EUR per year)	$f_yxy7	44.81	44.47	47.06	50.09	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; real state and business (EUR per year)	$f_yxy8	29.29	29.62	31.19	33.00	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; public administration and defence (EUR per year)	$f_yxy9	31.46	31.42	33.11	34.50	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; education (EUR per year)	$f_yxy10	31.50	31.48	32.63	34.00	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; health and social work (EUR per year)	$f_yxy11	24.30	24.53	25.74	26.82	National Accounts	Statistical	Office,	National	yxy
Lagged average gross earnings; other (EUR per year)	$f_yxy12	22.39	22.39	22.39	22.39	National Accounts	Statistical	Office,	National	yxy
Aggregate self-employment income (billion Euro)*	$f_yse	216.97	208.91	220.49	232.17	National Accounts	Statistical	Office,	National	yse
Aggregate income from capital in private households (billion Eur)	$f_yiy	351.89	422.09	422.09	422.09	National Accounts	Statistical	Office,	National	yiy, yiyot
HIPC Actual Rents for Housing (2005 = 100, annual data)	$f_housingrents	109.02	110.82	113.09	114.79	Eurostat				ypr, bho, xhc, xhcrt, xhcot xhcmomi
Updating factor of 1	$f_one	1.00	1.00	1.00	1.00					yds, ydses_o

Current pension value (Eur, weighted average of West/East German values)	$f_publicpension	34.05	35.93	37.24	37.60	Statutory Parameter, Public Pension Insurance	pdi00, poass, psu, psuor, psuwd
Average old-age pension for employees (Eur per month)	$f_poass_av	993.00	1054.00	1092.45	1102.99	Public Pension Insurance	
Average wage for civil servants (Eur/month)	$f_poacs	4240.00	4280.00	4517.28	4747.66	National Statistical Office	poacs
Average old-age pension for civil servants (Eur per month)	$f_poacs_av	3160.00	3170.00	3400.00	3432.81	National Statistical Office	
Average survivors' pension (Eur per month); Renten wegen Todes	$f_psu_av	630.00	664.00	688.22	694.86	Public Pension Insurance	
Average Orphans' Pension (Eur per month)	$f_psuor_av	205.00	216.00	223.88	226.04	Public Pension Insurance	
Average Widows' Pension (Eur per month)	$f_psuwd_av	652.00	688.00	713.10	719.98	Public Pension Insurance	
Aggregate income tax and ssc (billion Euro)	$f_tis	508.40	542.95	563.51	591.12	National Statistical Office	tis
Aggregate net wealth of private households (billion Euro)*	$f_afc	381.02	297.86	297.86	297.86	German Central Bank	afc
Average disability pension (Eur per month) from pension insurance	$f_pdi00_av	877.00	933.00	967.03	976.37	Public Pension Insurance	

* Consumer Price Index for 2020 has been uprated according to indicator ZCPIH from DG ECFIN. Earnings for 2020 have been uprated according to DG ECFIN projections on earnings (nominal compensation per employee). The data is available under: **http://ec.europa.eu/economy_finance/ameco/user/serie/SelectSerie.cfm.** The rest of variables has been provisionally uprated for 2020 by using the average harmonized price index for the months January-March 2020.

ANNEX 2. POLICY EFFECTS IN 2023-2024

In this section we analyse the direct tax-benefit policy effect on household disposable income in Germany between 2023 and 2024. We try to understand how changes (or non-changes) to tax-benefit policies have affected household incomes, 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 A2.1 and Figure A2.1 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 2024 tax-benefit policies (deflating the tax-benefit monetary parameters by Eurostat's Harmonized Index of Consumer Prices, HICP) and net incomes simulated under 2023 policies, as a percentage of mean equivalised household disposable income in 2023. 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 self-employed social insurance contributions (SIC), other 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.

From 2023 to 2024, the average household disposable income increased by 0.54%. A look at the effects across decile groups reveals a U-shaped distribution, with lower and higher deciles experiencing a more beneficial policy effect compared to middle-income classes. Deciles 4 to 6 are also the only deciles dealing with a slightly negative policy effect between 2023 and 2024. The largest policy impact can be found in the lowest decile of the distribution, where the increase in disposable income reaches 2.61%, whereas disposable income of the 5th decile decreased by 0.21%. On average, means-tested benefits (0.30% increase) and direct taxes (0.78% increase) contributed the most to the on average increasing effect on disposable income.

Compared to last year, inflation has decreased substantially while some elements of the tax-transfer system are adjusted retrospectively such that the price surge in 2023 led to the upward correction of e.g. tax parameters.

Public pensions have been increased in nominal terms again. However, these adjustments are smaller than the CPI increases. The policy effect of public pensions is mostly regressive, with largest losses in disposable income in the 2nd and 3rd decile. This is probably the case because recipients of public pensions are typically concentrated in the lower deciles of the disposable income distribution as income from (public) pensions is in general substantially less than labour income. In addition to this, public pensions usually make up a proportionally bigger part of disposable income in poorer pensioners' households than in richer ones, that in some cases receive additional income, for example from capital or rental income.

In case of direct taxes, the higher income classes benefit the most from the significant adjustment of the income tax bracket thresholds, which overcompensates the CPI increase substantially this year as tariff components have been adjusted based on the forecasted CPI development for 2023. This forecast stemmed from late 2022, when the government was expecting energy prices in 2023 to be much higher than they turned out to be.

Means-tested benefits like citizen's benefit and social assistance typically make up a higher share of disposable income in the lower parts of the income distribution. After the reform of the citizen's benefit, housing benefits and additional child benefit in 2023, the rates for these benefits also increased substantially in 2024 following the high inflation in 2023. The first three deciles of the

income distribution experience a large increase in disposable income between 1 % and 3.4 %. It is important to note, however, that the policy effects are calculated assuming full take-up of benefits, which could lead to an over-estimation of the progressive effects of means-tested benefits.

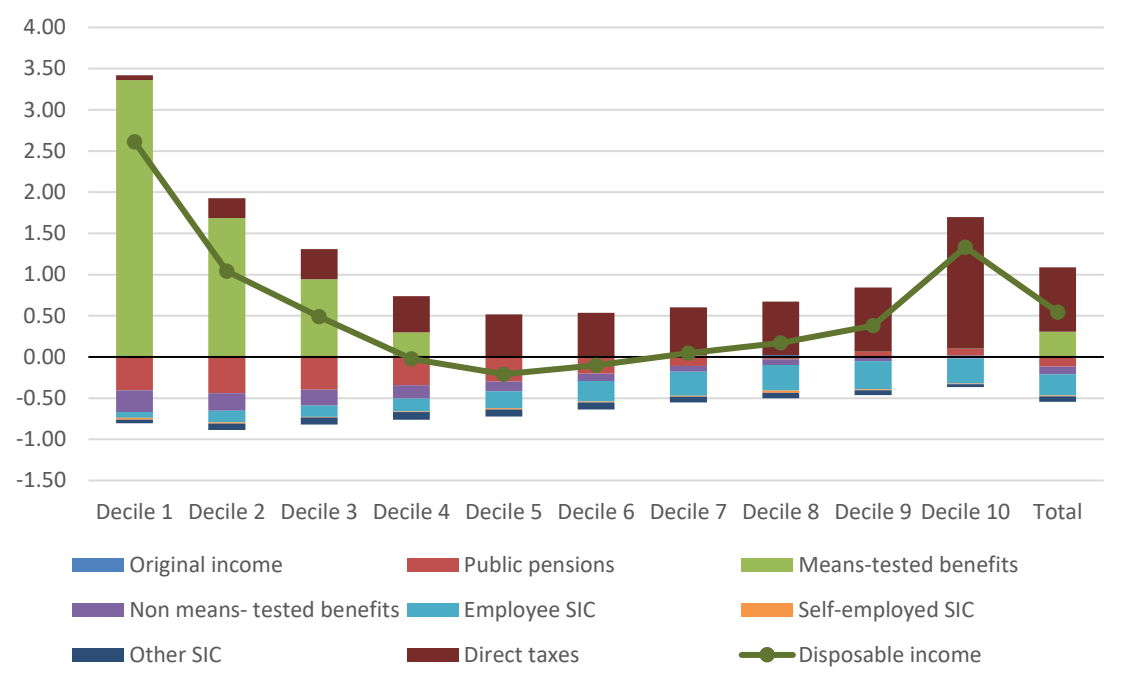
Non-means tested benefits decrease disposable income on average and also for every decile with a slightly regressive effect. Child benefits, the most relevant non-means tested benefit, make typically up a larger share of disposable income in lower income groups. In addition, the rates for child benefits have not been changed from 2023 to 2024.

Table A2.1: Policy effect in 2023-24, using CPI-indexation, %

Decile	*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	-0.41	3.36	-0.26	-0.07	-0.02	-0.04	0.06	2.61
2	0.00	-0.44	1.69	-0.21	-0.14	-0.01	-0.08	0.24	1.04
3	0.00	-0.40	0.95	-0.20	-0.13	-0.01	-0.09	0.36	0.49
4	0.00	-0.34	0.30	-0.16	-0.16	-0.01	-0.09	0.44	-0.02
5	0.01	-0.30	0.01	-0.12	-0.21	-0.01	-0.09	0.51	-0.21
6	0.00	-0.20	0.00	-0.09	-0.25	-0.01	-0.09	0.53	-0.10
7	0.01	-0.11	0.01	-0.07	-0.29	-0.01	-0.07	0.58	0.05
8	0.02	-0.02	-0.01	-0.07	-0.31	-0.03	-0.06	0.65	0.17
9	0.01	0.05	0.00	-0.05	-0.34	-0.01	-0.06	0.78	0.38
10	0.02	0.08	0.00	-0.02	-0.30	-0.01	-0.04	1.60	1.33
Total	**0.01**	**-0.12**	**0.30**	**-0.09**	**-0.26**	**-0.01**	**-0.07**	**0.78**	**0.54**

Notes: Other SIC include SIC paid by pensioners and non-working individuals.

Figure A2.1: Policy effect in 2023-24, using CPI-indexation, %



ANNEX 3. VALIDATION TABLES

Table A3.1. Original income in EUROMOD - Number of recipients (thousands)

	Simulated	EUROMOD				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Earnings (ils_earns)													
Employment income (yem)	N	40,054	40,054	40,054	40,054	41,101	41,781	42,163	NaN	0.97	0.96	0.95	NaN
Self-employment income (yse)	N	3,917	3,917	3,917	3,917	3,952	3,894	3,848	NaN	0.99	1.01	1.02	NaN
Other original income (ils_origy - ils_earns)													
Investment income (yiy)	N	11,680	11,680	11,680	11,680	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Property income (ypr)	N	6,544	6,544	6,544	6,544	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Income of children under 16 (yot)	N	149	149	149	149	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Private pension (ypp)	N	1,298	1,298	1,298	1,298	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Private transfers received (ypt)	N	1,883	1,883	1,883	1,883	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Maintenance payments (xmp)	N	2,246	2,246	2,246	2,246	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Contribution private health insurance (xhi_s)	Y	718	748	785	801	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

Continued...

	Source	Comments
Earnings (ils_earns)		
Employment income (yem)	National Accounts/Destatis	-
Self-employment income (yse)	National Accounts/Destatis	-
Other original income (ils_origy - ils_earns)		
Investment income (yiy)	-	-
Property income (ypr)	-	-
Income of children under 16 (yot)	-	-
Private pension (ypp)	German Socio-Economic Panel	-
Private transfers received (ypt)	German Socio-Economic Panel	-
Maintenance payments (xmp)	-	-
Contribution private health insurance (xhi_s)	-	-

Table A3.2. Original income in EUROMOD - Annual amounts (millions)

	Simulated	EUROMOD				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Earnings (ils_earns)													
Employment income (yem)	N	1,630,225	1,705,536	1,805,990	1,901,743	1,616,289	1,714,342	1,841,505	NaN	1.01	0.99	0.98	NaN
Self-employment income (yse)	N	107,743	103,741	109,491	115,291	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Other original income (ils_origy - ils_earns)													
Investment income (yiy)	N	15,586	18,695	18,695	18,695	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Property income (ypr)	N	46,273	47,037	48,000	48,722	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Income of children under 16 (yot)	N	271	282	299	315	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Private pension (ypp)	N	7,962	8,652	9,174	9,475	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Private transfers received (ypt)	N	11,244	11,724	12,438	13,098	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Maintenance payments (xmp)	N	13,187	14,331	15,195	15,694	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Contribution private health insurance (xhi_s)	Y	4,294	4,381	4,586	4,710	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

Table A3.3. Direct taxes and SIC - Number of payers (thousands)

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Direct taxes (ils_tax)																					
Income taxation (Einkommensteuer) (tin_s)	Y	47,708	49,298	47,889	47,533	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Capital income taxation (tinkt_s)	Y	3,146	3,502	3,083	3,083	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Property tax (tpr)	N	16,801	16,801	16,801	16,801	16,801	16,801	16,801	16,801	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Employee Social Insurance Contributions (ils_sicee)		35,604	35,833	35,562	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	33,922	34,525	34,799	NaN	1.05	1.04	1.02	NaN
employee SIC for old-age (tsceepi_s)	Y	35,604	35,833	35,562	35,756	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employee SIC for health (tsceehl_s)	Y	35,604	35,833	35,562	35,756	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employee SIC for long-term care (tsceeci_s)	Y	35,604	35,833	35,562	35,904	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employee SIC for unemployment (tsceeui_s)	Y	35,604	35,833	35,562	35,756	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employee SIC for statutory accident insurance (tsceeac_s)	Y	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Self-employed Social Insurance Contributions (ils_sicse)																					
self-employed SIC for old-age (tscsepi_s)	Y	765	765	765	765	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
self-employed SIC for health (tscsehl_s)	Y	1,896	1,922	1,873	1,884	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Employer Social Insurance Contributions (ils_sicer)																					
employer SIC for old-age (tscerpi_s)	Y	36,839	36,839	36,839	36,839	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employer SIC for health (tscerhl_s)	Y	36,839	36,839	36,839	36,839	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employer SIC for long-term care (tscerci_s)	Y	35,604	35,833	35,562	35,756	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employer SIC for unemployment (tscerui_s)	Y	35,604	35,833	35,562	35,756	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
employer SIC for statutory accident insurance (tscerac_s)	Y	35,604	35,833	35,562	35,756	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Credited Contributions (ils_sicct)																					
Other Contributions (ils_sicot)																					
pensioner SIC for health (tscpehl_s)	Y	17,192	17,131	17,104	17,109	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
pesnioner SIC for long-term care (tscpeci_s)	Y	17,192	17,131	17,104	17,109	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
health/long-term care insurance contribution for non-working (tscot_s)	Y	929	893	936	872	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

Continued...

	Source	Comments
Direct taxes (ils_tax)		
Income taxation (Einkommensteuer) (tin_s)	-	-
Capital income taxation (tinkt_s)	-	-
Property tax (tpr)	OECD Revenue Statistics	-
Employee Social Insurance Contributions (ils_sicee)		
employee SIC for old-age (tsceepi_s)	Nationals Accounts/Destatis	-
employee SIC for health (tsceehl_s)	Nationals Accounts/Destatis	-
employee SIC for long-term care (tsceeci_s)	Nationals Accounts/Destatis	-
employee SIC for unemployment (tsceeui_s)	Nationals Accounts/Destatis	-
employee SIC for statutory accident insurance (tsceeac_s)	-	-
Self-employed Social Insurance Contributions (ils_sicse)		
self-employed SIC for old-age (tscsepi_s)	National Accounts/Destatis	-
self-employed SIC for health (tscsehl_s)	National Accounts/Destatis	-
Employer Social Insurance Contributions (ils_sicer)		
employer SIC for old-age (tscerpi_s)	National Accounts/Destatis	-
employer SIC for health (tscerhl_s)	National Accounts/Destatis	-
employer SIC for long-term care (tscerci_s)	National Accounts/Destatis	-
employer SIC for unemployment (tscerui_s)	National Accounts/Destatis	-
employer SIC for statutory accident insurance (tscerac_s)	National Accounts/Destatis	-
Credited Contributions (ils_sicct)		
Other Contributions (ils_sicot)		
pensioner SIC for health (tscpehl_s)	-	-

Continued...

	Source	Comments
pesnioner SIC for long-term care (tscpeci_s)	-	-
health/long-term care insurance contribution for non-working (tscot_s)	-	-

Table A3.4. Direct taxes and SIC - Annual amounts (millions)

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Direct taxes (ils_tax)																					
Income taxation (Einkommensteuer) (tin_s)	Y	364,429	387,723	399,477	412,040	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	361,681	374,538	384,907	NaN	1.01	1.04	1.04	NaN
Capital income taxation (tinkt_s)	Y	2,929	3,654	3,481	3,481	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Property tax (tpr)	N	5,598	6,083	6,450	6,662	5,598	5,598	5,598	5,598	1.00	1.09	1.15	1.19	5,994	6,113	NaN	NaN	0.93	1.00	NaN	NaN
Employee Social Insurance Contributions (ils_sicee)		261,085	262,789	278,235	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	229,146	246,434	262,636	NaN	1.14	1.07	1.06	NaN
employee SIC for old-age (tsceepi_s)	Y	122,282	126,890	133,082	139,844	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	110,967	118,807	124,838	NaN	1.10	1.07	1.07	NaN
employee SIC for health (tsceehl_s)	Y	103,024	98,191	104,223	109,971	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	86,109	92,704	98,429	NaN	1.20	1.06	1.06	NaN
employee SIC for long-term care (tsceeci_s)	Y	20,001	21,336	22,327	26,988	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	17,419	19,239	21,552	NaN	1.15	1.11	1.04	NaN
employee SIC for unemployment (tsceeui_s)	Y	15,778	16,373	18,603	19,548	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	14,651	15,684	17,817	NaN	1.08	1.04	1.04	NaN
employee SIC for statutory accident insurance (tsceeac_s)	Y	0	0	0	0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Self-employed Social Insurance Contributions (ils_sicse)		12,348	11,969	12,551	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	9,365	9,671	10,039	NaN	1.32	1.24	1.25	NaN
self-employed SIC for old-age (tscsepi_s)	Y	3,746	3,654	3,831	4,008	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	1,497	1,597	1,693	NaN	2.50	2.29	2.26	NaN
self-employed SIC for health (tscsehl_s)	Y	8,602	8,315	8,720	9,048	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	6,510	6,674	6,970	NaN	1.32	1.25	1.25	NaN
Employer Social Insurance Contributions (ils_sicer)		267,462	279,008	297,170	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	253,465	266,727	283,901	NaN	1.06	1.05	1.05	NaN
employer SIC for old-age (tscerpi_s)	Y	123,325	127,789	134,895	141,502	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	118,006	123,073	129,620	NaN	1.05	1.04	1.04	NaN
employer SIC for health (tscerhl_s)	Y	96,121	98,965	105,799	111,418	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	90,734	94,871	100,861	NaN	1.06	1.04	1.05	NaN
employer SIC for long-term care (tscerci_s)	Y	18,339	18,909	19,805	23,139	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	16,969	17,843	20,043	NaN	1.08	1.06	0.99	NaN
employer SIC for unemployment (tscerui_s)	Y	15,836	16,431	18,759	19,701	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	16,054	16,860	18,733	NaN	0.99	0.97	1.00	NaN
employer SIC for statutory accident insurance (tscerac_s)	Y	13,841	16,914	17,913	18,876	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	11,702	14,080	14,644	NaN	1.18	1.20	1.22	NaN
Credited Contributions (ils_sicct)																					
Other Contributions (ils_sicot)																					
pensioner SIC for health (tscpehl_s)	Y	26,063	27,063	28,547	29,242	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
pesnioner SIC for long-term care (tscpeci_s)	Y	10,133	10,522	10,893	12,552	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
health/long-term care insurance contribution for non-working (tscot_s)	Y	2,323	2,175	2,389	2,391	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

Table A3.5. Benefits - Number of recipients (thousands)

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Pensions (ils_pen)																					
Old-age pension (poa00)	N	1,783	1,783	1,783	1,783	1,783	1,783	1,783	1,783	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Old-age pension for civil servants (poacs)	N	1,660	1,660	1,660	1,660	1,660	1,660	1,660	1,660	1.00	1.00	1.00	1.00	1,737	1,758	1,773	NaN	0.96	0.94	0.94	NaN
Pension for employees in public service (Rente der Zusatzversorgungskassen des öffentlichen Dienstes) (poapu)	N	581	581	581	581	581	581	581	581	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Pension schemes for self-employed, freelancers, and farmers (Rente berufsständischer Versorgungswerke, landwirtschaftlicher Alterskassen und Landabgaberenten) and Supplements to old-age pension insurance contributions for farmers (Zuschüsse der landwirtschaftlichen Alterskassen) (poaps)	N	228	228	228	228	228	228	228	228	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Old-age pension of statutory pension insurance (poass)	N	15,558	15,558	15,558	15,558	15,558	15,558	15,558	15,558	1.00	1.00	1.00	1.00	18,518	18,575	18,743	NaN	0.84	0.84	0.83	NaN
Old-age pension from a foreign country (Auslandsrente) (poaab)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	1,222	1,213	NaN	NaN	0.00	0.00	NaN	NaN
Pensions for reduced ability to work (pdi00)	N	1,291	1,291	1,291	1,291	1,291	1,291	1,291	1,291	1.00	1.00	1.00	1.00	1,809	1,790	1,761	NaN	0.71	0.72	0.73	NaN
Pensions for disability to work for civil servants (pdiot)	N	100	100	100	100	100	100	100	100	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Widow(er)'s pension (psuwd)	N	3,856	3,856	3,856	3,856	3,856	3,856	3,856	3,856	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Orphan's pension (psuor)	N	202	202	202	202	202	202	202	202	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Benefits for war victims and burden sharing (pdiwr)	N	9	9	9	9	9	9	9	9	1.00	1.00	1.00	1.00	NaN	12	NaN	NaN	NaN	0.72	NaN	NaN
Disability pension from stat. acc. Insurance (Rente der gesetzlichen Unfallversicherung); NOTE: we simulate the pension for individuals aged under 65 (pdiss_s)	Y	281	281	281	281	143	143	143	143	1.97	1.97	1.97	1.97	730	711	692	NaN	0.38	0.40	0.41	NaN

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Disability pensions for those aged over 65, that include the Disability pension from stat. acc. Insurance (Rente der gesetzlichen Unfallversicherung) and the Long-term care benefit from the pension insurance (Pflegegeld) (poadi)	N	184	184	184	184	184	184	184	184	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Benefits for war victims (Lastenausgleichsrente, Rente der Kriegsopferversorgung, SED-Opferrente) (poawr)	N	26	26	26	26	26	26	26	26	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Means-tested benefits (ils_benmt)																					
Unemployment benefits II and social benefits (ALG II und Sozialgeld) (bunnc_s)	Y	3,625	3,606	3,305	3,622	3,792	3,792	3,792	3,792	0.96	0.95	0.87	0.96	2,528	2,501	2,668	NaN	1.43	1.44	1.24	NaN
General social assistance (Sozialhilfe) (bsa00_s)	Y	162	165	121	144	464	464	464	464	0.35	0.36	0.26	0.31	215	226	225	NaN	0.75	0.73	0.54	NaN
Old-age social assistance (Grundsicherung im Alter) (bsaoa_s)	Y	931	935	822	970	805	805	805	805	1.16	1.16	1.02	1.21	1,112	1,164	1,223	NaN	0.84	0.80	0.67	NaN
Advances on alimony payments (Unterhaltsvorschuss) (bsaam)	N	1,028	1,028	1,028	1,028	1,028	1,028	1,028	1,028	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Advances on alimony payments (Unterhaltsvorschuss) (bcham)	N	1,028	1,028	1,028	1,028	1,028	1,028	1,028	1,028	1.00	1.00	1.00	1.00	833	825	830	NaN	1.23	1.25	1.24	NaN
Benefits from non-profitable charity organizations (Geldleistungen von Wohlfahrtsorganisationen, z.B. AWO) (bsapu)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Additional child benefits (Kinderzuschlag) (bchot_s)	Y	1,003	954	1,236	1,428	1,035	1,035	1,035	1,035	0.97	0.92	1.19	1.38	293	285	363	NaN	3.42	3.35	3.40	NaN
Education benefits (BaFöG) (bed_s)	Y	974	963	1,043	971	832	832	832	832	1.17	1.16	1.25	1.17	429	419	441	NaN	2.27	2.30	2.36	NaN
Main housing benefits (Wohngeld) (bho00_s)	Y	1,398	1,249	3,811	3,193	470	470	470	470	2.97	2.66	8.11	6.79	595	652	1,174	NaN	2.35	1.92	3.25	NaN
Allowance to the Agricultural Pension Funds (Zuschüsse zu landwirtschaftl. Alterskassen) (bsa01)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Education Allowance (Bildungspaket) (bched_s)	Y	1,524	1,497	1,732	1,846	607	607	607	607	2.51	2.47	2.85	3.04	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Other social assistance (Sozialgeld) (bsaot_s)	Y	395	391	391	452	716	716	716	716	0.55	0.55	0.55	0.63	448	485	539	NaN	0.88	0.81	0.73	NaN
One- off payment for unemployed and social assistance recipients (bsaxp_s)	Y	0	6,164	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Heating bonus (Heizkostenzuschuss) (bhtxp_s)	Y	0	1,167	1,167	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Non-means-tested benefits (ils_bennt)																					
Child benefits (Kindergeld) (bch00_s)	Y	9,262	9,262	9,262	9,262	10,844	10,844	10,844	10,844	0.85	0.85	0.85	0.85	9,885	10,080	10,372	NaN	0.94	0.92	0.89	NaN
Maternity leave (bmact_s)	Y	951	951	951	951	476	476	476	476	2.00	2.00	2.00	2.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Parental leave (bplct_s)	Y	697	697	697	696	1,131	1,131	1,131	1,131	0.62	0.62	0.62	0.61	1,009	998	954	NaN	0.69	0.70	0.73	NaN
Unemployment benefits I (ALG I) (bunct_s)	Y	1,106	1,106	1,106	1,106	1,151	1,151	1,151	1,151	0.96	0.96	0.96	0.96	1,461	1,482	1,556	NaN	0.76	0.75	0.71	NaN
Sickness Benefits (Krankengeld der GKV, prvt. Pflegezusatz- oder Krankentagegeldversicherung) (bhl_s)	Y	875	875	875	875	1,148	1,148	1,148	1,148	0.76	0.76	0.76	0.76	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Long-term care benefits from pension insurance (Pflegegeld) (pdica)	N	366	366	366	366	366	366	366	366	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Benefits for business start-ups (Förderung der Existenzgründung: Ich-AG, Überbrückungsgeld) (bunot)	N	34	34	34	34	34	34	34	34	1.00	1.00	1.00	1.00	20	20	25	NaN	1.71	1.71	1.36	NaN
Benefits for re-training (Umschulungszuschüsse) (buntr)	N	771	771	771	771	771	771	771	771	1.00	1.00	1.00	1.00	178	171	184	NaN	4.33	4.51	4.19	NaN
Severance pay (Kurzarbeitergeld, Schlechtwettergeld, Wintergeld, Konkursausfallgeld, Umschulungsgeld, u.ä.) (ysv)	N	2,022	2,022	2,022	2,022	2,022	2,022	2,022	2,022	1.00	1.00	1.00	1.00	1,852	426	241	NaN	1.09	4.75	8.39	NaN
Benefits for early retirement (Vorruhestandsgeld) (byr)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	280	NaN	NaN	NaN	0.00	NaN	NaN	NaN
Care benefits for children (Pflegegeld für Pflegekinder, Pflegegeld für pflegebedürftige Kinder nach SGB XI, Betreuungsgeld) (bfaot)	N	7,860	7,860	7,860	7,860	7,860	7,860	7,860	7,860	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Unemployment benefits: lump-sum (bunls)	N	170	170	170	170	170	170	170	170	1.00	1.00	1.00	1.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Simulated wage compensation (Kurzarbeitergeld) (bwkmcee_s)	Y	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Child bonus (covid-19 policy) (bchls_s)	Y	9,267	9,267	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Lump-sum energy transfer (Energiepreispauschale) (blsxp_s)	Y	0	58,273	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Lump-sum energy transfer (for students) (blsxpsd_s)	Y	0	0	2,381	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

Continued...

	Source	Comments
Pensions (ils_pen)		
Old-age pension (poa00)	Federal Ministry of Labour and Social Affairs	-

Continued...

	Source	Comments
Old-age pension for civil servants (poacs)	National Accounts/Federal Ministry of Labour and Social Affairs	-
Pension for employees in public service (Rente der Zusatzversorgungskassen des öffentlichen Dienstes) (poapu)	Federal Ministry of Labour and Social Affairs	-
Pension schemes for self-employed, freelancers, and farmers (Rente berufsständischer Versorgungswerke, landwirtschaftlicher Alterskassen und Landabgaberenten) and Supplements to old-age pension insurance contributions for farmers (Zuschüsse der landwirtschaftlichen Alterskassen) (poaps)	-	-
Old-age pension of statutory pension insurance (poass)	Deutsche Rentenversicherung	-
Old-age pension from a foreign country (Auslandsrente) (poaab)	Deutsche Rentenversicherung	-
Pensions for reduced ability to work (pdi00)	Deutsche Rentenversicherung	-
Pensions for disability to work for civil servants (pdiot)	-	-
Widow(er)'s pension (psuwd)	-	-
Orphan's pension (psuor)	-	-
Benefits for war victims and burden sharing (pdiwr)	Destatis	-
Disability pension from stat. acc. Insurance (Rente der gesetzlichen Unfallversicherung); NOTE: we simulate the pension for individuals aged under 65 (pdiss_s)	Statutory Accident Insurance	-
Disability pensions for those aged over 65, that include the Disability pension from stat. acc. Insurance (Rente der gesetzlichen Unfallversicherung) and the Long-term care benefit from the pension insurance (Pflegegeld) (poadi)	-	-
Benefits for war victims (Lastenausgleichsrente, Rente der Kriegsopferversorgung, SED-Opferrente) (poawr)	-	-

Continued...

	Source	Comments
Means-tested benefits (ils_benmt)		
Unemployment benefits II and social benefits (ALG II und Sozialgeld) (bunnc_s)	Federal Employment Agency	-
General social assistance (Sozialhilfe) (bsa00_s)	Destatis	-
Old-age social assistance (Grundsicherung im Alter) (bsaoa_s)	Destatis	-
Advances on alimony payments (Unterhaltsvorschuss) (bsaam)	-	-
Advances on alimony payments (Unterhaltsvorschuss) (bcham)	Federal Ministry for Family Affairs, Senior Citizens, Women and Youth	-
Benefits from non-profitable charity organizations (Geldleistungen von Wohlfahrtsorganisationen, z.B. AWO) (bsapu)	-	-
Additional child benefits (Kinderzuschlag) (bchot_s)	Federal Employment Agency	-
Education benefits (BaFöG) (bed_s)	Nationals Accounts/Destatis	-
Main housing benefits (Wohngeld) (bho00_s)	Destatis	-
Allowance to the Agricultural Pension Funds (Zuschüsse zu landwirtschaftl. Alterskassen) (bsa01)	-	-
Education Allowance (Bildungspaket) (bched_s)	-	-
Other social assistance (Sozialgeld) (bsaot_s)	Federal Employment Agency	-
One- off payment for unemployed and social assistance recipients (bsaxp_s)	-	-
Heating bonus (Heizkostenzuschuss) (bhtxp_s)	-	-
Non-means-tested benefits (ils_bennt)		
Child benefits (Kindergeld) (bch00_s)	Federal Employment Agency	-
Maternity leave (bmact_s)	Federal Ministry of Labour and Social Affairs	-
Parental leave (bplct_s)	Destatis	-
Unemployment benefits I (ALG I) (bunct_s)	Federal Employment Agency	-
Sickness Benefits (Krankengeld der GKV, prvt. Pflegezusatz- oder Krankentagegeldversicherung) (bhl_s)	National Association of Statutory Health Insurance Funds	-

Continued...

	Source	Comments
Long-term care benefits from pension insurance (Pflegegeld) (pdica)	National Association of Statutory Health Insurance Funds	-
Benefits for business start-ups (Förderung der Existenzgründung: Ich-AG, Überbrückungsgeld) (bunot)	Federal Employment Agency	-
Benefits for re-training (Umschulungszuschüsse) (buntr)	-	-
Severance pay (Kurzarbeitergeld, Schlechtwettergeld, Wintergeld, Konkursausfallgeld, Umschulungsgeld, u.ä.) (ysv)	Federal Employment Agency	-
Benefits for early retirement (Vorruhestandsgeld) (byr)	Deutsche Rentenversicherung	-
Care benefits for children (Pflegegeld für Pflegekinder, Pflegegeld für pflegebedürftige Kinder nach SGB XI, Betreuungsgeld) (bfaot)	-	-
Unemployment benefits: lump-sum (bunls)	-	-
Simulated wage compensation (Kurzarbeitergeld) (bwkmcee_s)	-	-
Child bonus (covid-19 policy) (bchls_s)	-	-
Lump-sum energy transfer (Energiepreispauschale) (blsxp_s)	-	-
Lump-sum energy transfer (for students) (blsxpsd_s)	-	-

Table A3.6. Benefits - Annual amounts (million)

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Pensions (ils_pen)																					
Old-age pension (poa00)	N	19,439	21,124	22,398	23,133	19,439	19,439	19,439	19,439	1.00	1.09	1.15	1.19	25,060	26,343	26,645	NaN	0.78	0.80	0.84	NaN
Old-age pension for civil servants (poacs)	N	64,729	65,340	68,962	72,479	64,729	64,729	64,729	64,729	1.00	1.01	1.07	1.12	66,300	68,893	71,941	NaN	0.98	0.95	0.96	NaN
Pension for employees in public service (Rente der Zusatzversorgungskassen des öffentlichen Dienstes) (poapu)	N	7,392	8,032	8,517	8,796	7,392	7,392	7,392	7,392	1.00	1.09	1.15	1.19	12,841	13,160	NaN	NaN	0.58	0.61	NaN	NaN
Pension schemes for self-employed, freelancers, and farmers (Rente berufsständischer Versorgungswerke, landwirtschaftlicher Alterskassen und Landabgaberenten) and Supplements to old-age pension insurance contributions for farmers (Zuschüsse der landwirtschaftlichen Alterskassen) (poaps)	N	3,937	4,278	4,536	4,685	3,937	3,937	3,937	3,937	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Old-age pension of statutory pension insurance (poass)	N	258,308	272,570	282,508	285,239	258,308	258,308	258,308	258,308	1.00	1.06	1.09	1.10	243,586	253,692	268,980	NaN	1.06	1.07	1.05	NaN
Old-age pension from a foreign country (Auslandsrente) (poaab)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	5,543	5,837	NaN	NaN	0.00	0.00	NaN	NaN
Pensions for reduced ability to work (pdi00)	N	15,501	16,357	16,954	17,117	15,501	15,501	15,501	15,501	1.00	1.06	1.09	1.10	19,038	20,041	20,667	NaN	0.81	0.82	0.82	NaN
Pensions for disability to work for civil servants (pdiot)	N	2,228	2,421	2,567	2,651	2,228	2,228	2,228	2,228	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Widow(er)'s pension (psuwd)	N	40,703	42,950	44,516	44,946	40,703	40,703	40,703	40,703	1.00	1.06	1.09	1.10	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Orphan's pension (psuor)	N	652	688	713	720	652	652	652	652	1.00	1.06	1.09	1.10	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Benefits for war victims and burden sharing (pdiwr)	N	14	15	16	16	14	14	14	14	1.00	1.09	1.15	1.19	NaN	248	NaN	NaN	NaN	0.06	NaN	NaN
Disability pension from stat. acc. Insurance (Rente der gesetzlichen Unfallversicherung); NOTE: we simulate the pension for individuals aged under 65 (pdiss_s)	Y	2,721	2,722	2,820	2,944	1,472	1,472	1,472	1,472	1.85	1.85	1.92	2.00	5,903	5,911	6,052	NaN	0.46	0.46	0.47	NaN
Disability pensions for those aged over 65, that include the Disability pension from stat. acc. Insurance (Rente der gesetzlichen Unfallversicherung) and the Long-term care benefit from the pension insurance (Pflegegeld) (poadi)	N	1,904	2,069	2,193	2,265	1,904	1,904	1,904	1,904	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Benefits for war victims (Lastenausgleichsrente, Rente der Kriegsopferversorgung, SED-Opferrente) (poawr)	N	165	179	190	196	165	165	165	165	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Means-tested benefits (ils_benmt)																					
Unemployment benefits II and social benefits (ALG II und Sozialgeld) (bunnc_s)	Y	25,187	26,144	27,614	31,764	14,043	14,043	14,043	14,043	1.79	1.86	1.97	2.26	25,607	25,979	30,605	NaN	0.98	1.01	0.90	NaN
General social assistance (Sozialhilfe) (bsa00_s)	Y	661	693	648	784	2,936	2,936	2,936	2,936	0.23	0.24	0.22	0.27	1,273	1,369	1,581	NaN	0.52	0.51	0.41	NaN
Old-age social assistance (Grundsicherung im Alter) (bsaoa_s)	Y	4,911	5,062	5,430	6,384	5,284	5,284	5,284	5,284	0.93	0.96	1.03	1.21	8,150	8,809	10,087	NaN	0.60	0.57	0.54	NaN
Advances on alimony payments (Unterhaltsvorschuss) (bsaam)	N	1,155	1,255	1,331	1,374	1,155	1,155	1,155	1,155	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Advances on alimony payments (Unterhaltsvorschuss) (bcham)	N	1,155	1,255	1,331	1,374	1,155	1,155	1,155	1,155	1.00	1.09	1.15	1.19	2,012	2,007	2,178	NaN	0.57	0.63	0.61	NaN
Benefits from non-profitable charity organizations (Geldleistungen von Wohlfahrtsorganisationen, z.B. AWO) (bsapu)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Additional child benefits (Kinderzuschlag) (bchot_s)	Y	2,839	2,674	4,272	5,617	2,009	2,009	2,009	2,009	1.41	1.33	2.13	2.80	1,269	1,287	1,871	NaN	2.24	2.08	2.28	NaN
Education benefits (BaFöG) (bed_s)	Y	5,305	5,171	6,071	5,737	4,421	4,421	4,421	4,421	1.20	1.17	1.37	1.30	2,895	2,975	3,389	NaN	1.83	1.74	1.79	NaN
Main housing benefits (Wohngeld) (bho00_s)	Y	2,614	2,381	8,793	7,362	813	813	813	813	3.21	2.93	10.81	9.05	1,406	1,825	4,317	NaN	1.86	1.30	2.04	NaN
Allowance to the Agricultural Pension Funds (Zuschüsse zu landwirtschaftl. Alterskassen) (bsa01)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Education Allowance (Bildungspaket) (bched_s)	Y	391	387	499	594	764	764	764	764	0.51	0.51	0.65	0.78	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Other social assistance (Sozialgeld) (bsaot_s)	Y	899	905	1,015	1,462	4,107	4,107	4,107	4,107	0.22	0.22	0.25	0.36	825	1,092	1,289	NaN	1.09	0.83	0.79	NaN
One- off payment for unemployed and social assistance recipients (bsaxp_s)	Y	NaN	1,145	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Heating bonus (Heizkostenzuschuss) (bhtxp_s)	Y	NaN	323	482	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Non-means-tested benefits (ils_bennt)																					
Child benefits (Kindergeld) (bch00_s)	Y	39,875	39,875	45,330	45,330	46,026	46,026	46,026	46,026	0.87	0.87	0.98	0.98	47,626	47,920	54,229	NaN	0.84	0.83	0.84	NaN
Maternity leave (bmact_s)	Y	732	729	728	731	510	510	510	510	1.44	1.43	1.43	1.43	761	706	665	NaN	0.96	1.03	1.10	NaN
Parental leave (bplct_s)	Y	2,712	2,715	2,732	2,754	7,380	7,380	7,380	7,380	0.37	0.37	0.37	0.37	7,462	7,640	7,444	NaN	0.36	0.36	0.37	NaN
Unemployment benefits I (ALG I) (bunct_s)	Y	8,657	9,399	9,962	10,289	9,102	9,102	9,102	9,102	0.95	1.03	1.09	1.13	19,460	16,588	18,799	NaN	0.44	0.57	0.53	NaN

	Simulated	EUROMOD				SILC				Ratio				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Sickness Benefits (Krankengeld der GKV, prvt. Pflegezusatz- oder Krankentagegeldversicherung) (bhl_s)	Y	9,564	9,646	10,052	10,636	7,167	7,167	7,167	7,167	1.33	1.35	1.40	1.48	16,610	17,950	19,110	NaN	0.58	0.54	0.53	NaN
Long-term care benefits from pension insurance (Pflegegeld) (pdica)	N	1,454	1,580	1,675	1,730	1,454	1,454	1,454	1,454	1.00	1.09	1.15	1.19	13,920	14,920	16,180	NaN	0.10	0.11	0.10	NaN
Benefits for business start-ups (Förderung der Existenzgründung: Ich-AG, Überbrückungsgeld) (bunot)	N	139	151	160	165	139	139	139	139	1.00	1.09	1.15	1.19	238	232	270	NaN	0.58	0.65	0.59	NaN
Benefits for re-training (Umschulungszuschüsse) (buntr)	N	2,369	2,574	2,729	2,819	2,369	2,369	2,369	2,369	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Severance pay (Kurzarbeitergeld, Schlechtwettergeld, Wintergeld, Konkursausfallgeld, Umschulungsgeld, u.ä.) (ysv)	N	10,216	11,102	11,771	12,157	10,216	10,216	10,216	10,216	1.00	1.09	1.15	1.19	12,120	2,272	500	NaN	0.84	4.89	23.54	NaN
Benefits for early retirement (Vorruhestandsgeld) (byr)	N	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Care benefits for children (Pflegegeld für Pflegekinder, Pflegegeld für pflegebedürftige Kinder nach SGB XI, Betreuungsgeld) (bfaot)	N	5,131	5,576	5,912	6,106	5,131	5,131	5,131	5,131	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Unemployment benefits: lump-sum (bunls)	N	4,443	4,829	5,120	5,288	4,443	4,443	4,443	4,443	1.00	1.09	1.15	1.19	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Simulated wage compensation (Kurzarbeitergeld) (bwkmcee_s)	Y	0	0	0	0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Child bonus (covid-19 policy) (bchls_s)	Y	2,268	1,512	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Lump-sum energy transfer (Energiepreispauschale) (blsxp_s)	Y	NaN	17,965	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Lump-sum energy transfer (for students) (blsxpsd_s)	Y	NaN	NaN	476	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

Table A3.7. Distribution of equivalised disposable income

	EUROMOD				External				Ratio			
	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Decile 1	3.64	3.68	3.75	3.76	3.30	3.30	NaN	NaN	1.10	1.12	NaN	NaN
Decile 2	5.10	5.11	5.17	5.15	5.30	5.30	NaN	NaN	0.96	0.96	NaN	NaN
Decile 3	6.13	6.15	6.19	6.15	6.30	6.30	NaN	NaN	0.97	0.98	NaN	NaN
Decile 4	7.10	7.13	7.10	7.03	7.20	7.20	NaN	NaN	0.99	0.99	NaN	NaN
Decile 5	8.14	8.16	8.10	8.03	8.30	8.20	NaN	NaN	0.98	0.99	NaN	NaN
Decile 6	9.25	9.28	9.22	9.16	9.30	9.20	NaN	NaN	1.00	1.01	NaN	NaN
Decile 7	10.56	10.57	10.52	10.48	10.50	10.40	NaN	NaN	1.01	1.02	NaN	NaN
Decile 8	12.20	12.18	12.15	12.14	12.10	12.00	NaN	NaN	1.01	1.02	NaN	NaN
Decile 9	14.70	14.67	14.66	14.67	14.50	14.40	NaN	NaN	1.01	1.02	NaN	NaN
Decile 10	23.18	23.07	23.15	23.44	23.20	23.70	NaN	NaN	1.00	0.97	NaN	NaN
Median	24,698	26,092	27,308	28,340	24,925	26,274	NaN	NaN	0.99	0.99	NaN	NaN
Mean	27,473	29,005	30,528	31,848	28,569	30,308	NaN	NaN	0.96	0.96	NaN	NaN
Gini	29.12	28.94	28.84	29.17	29.00	29.40	NaN	NaN	1.00	0.98	NaN	NaN
S80/20	4.33	4.29	4.24	4.28	4.38	4.44	NaN	NaN	0.99	0.97	NaN	NaN

Table A3.8. At-risk-of-poverty rates (%) by sex and age

	EUROMOD				External				Ratio			
	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
40% median HDI by sex												
Total	3.18	2.98	2.62	2.26	4.40	4.40	NaN	NaN	0.72	0.68	NaN	NaN
Males	3.36	3.15	2.78	2.34	4.30	4.20	NaN	NaN	0.78	0.75	NaN	NaN
Females	3.00	2.83	2.46	2.18	4.60	4.50	NaN	NaN	0.65	0.63	NaN	NaN
50% median HDI by sex												
Total	8.57	8.56	7.75	7.44	8.50	8.30	NaN	NaN	1.01	1.03	NaN	NaN
Males	8.40	8.42	7.72	7.30	8.00	7.90	NaN	NaN	1.05	1.07	NaN	NaN
Females	8.74	8.69	7.78	7.57	8.90	8.70	NaN	NaN	0.98	1.00	NaN	NaN
60% median HDI by sex												
Total	15.98	15.89	14.95	14.76	14.80	14.40	NaN	NaN	1.08	1.10	NaN	NaN
Males	15.46	15.45	14.59	14.36	14.00	13.70	NaN	NaN	1.10	1.13	NaN	NaN
Females	16.49	16.31	15.29	15.14	15.50	15.10	NaN	NaN	1.06	1.08	NaN	NaN
70% median HDI by sex												
Total	24.29	24.35	23.34	23.28	22.90	22.70	NaN	NaN	1.06	1.07	NaN	NaN
Males	23.44	23.53	22.54	22.41	21.80	21.60	NaN	NaN	1.08	1.09	NaN	NaN
Females	25.13	25.15	24.13	24.13	23.90	23.80	NaN	NaN	1.05	1.06	NaN	NaN
60% median HDI by age group												
0-15 years	14.46	15.23	12.16	11.04	14.70	13.80	NaN	NaN	0.98	1.10	NaN	NaN
16-24 years	24.58	24.63	22.52	21.62	22.10	22.20	NaN	NaN	1.11	1.11	NaN	NaN
25-49 years	12.98	13.18	11.74	10.90	12.00	11.90	NaN	NaN	1.08	1.11	NaN	NaN
50-64 years	14.05	13.71	13.59	13.19	12.30	11.30	NaN	NaN	1.14	1.21	NaN	NaN
65+ years	19.88	18.95	19.88	21.84	18.30	18.40	NaN	NaN	1.09	1.03	NaN	NaN

Table A3.9. Consumption taxes (non-calibrated) - Annual amounts (millions)

	Simulated	EUROMOD				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Consumption-tax-related statistics non-calibrated (ils_extstat_ittncal)													
Aggregate expenditures non-calibrated (ils_extstat_ittncal_il_itt_expnc)													
01 Food and non-alcoholic beverages (il_x01)	Y	186,396	197,009	207,658	216,611	200,574	216,357	216,357	216,357	0.93	0.91	0.96	1.00
02 Alcoholic beverages, tobacco, etc. (il_x02)	Y	26,600	28,111	29,618	30,920	60,732	58,870	58,870	58,870	0.44	0.48	0.50	0.53
03 Clothing and footwear (il_x03)	Y	68,163	71,926	75,909	79,360	65,655	76,441	76,441	76,441	1.04	0.94	0.99	1.04
04 Housing, water and fuel (exc. imputed rent) (il_x04)	Y	250,786	265,361	279,735	291,394	261,392	282,230	282,230	282,230	0.96	0.94	0.99	1.03
05 Furnishings, household equipment, etc. (il_x05)	Y	65,979	69,649	73,328	76,595	120,215	130,085	130,085	130,085	0.55	0.54	0.56	0.59
06 Health (il_x06)	Y	62,993	66,509	69,769	72,765	96,115	98,899	98,899	98,899	0.66	0.67	0.71	0.74
07 Transport (il_x07)	Y	211,277	222,977	235,189	246,239	224,030	253,929	253,929	253,929	0.94	0.88	0.93	0.97
08 Communications (il_x08)	Y	42,852	45,282	47,828	49,939	39,924	41,236	41,236	41,236	1.07	1.10	1.16	1.21
09 Recreation and culture (il_x09)	Y	153,620	162,127	170,669	178,115	162,014	187,327	187,327	187,327	0.95	0.87	0.91	0.95
10 Education (il_x10)	Y	3,303	3,474	3,685	3,868	14,506	14,988	14,988	14,988	0.23	0.23	0.25	0.26
11 Hotels and restaurants (il_x11)	Y	76,291	80,539	84,774	88,488	65,797	101,028	101,028	101,028	1.16	0.80	0.84	0.88
12 Miscellaneous good and services (il_x12)	Y	170,496	179,835	189,541	198,354	224,607	235,981	235,981	235,981	0.76	0.76	0.80	0.84
Revenue from indirect taxes (non calibrated) (ils_extstat_ittncal_il_itt_revnc)													
VAT Total Revenue (il_tva)	Y	131,976	139,377	144,307	159,881	260,333	289,641	286,587	NaN	0.51	0.48	0.50	NaN
Excises Total Revenue (il_tx)	Y	39,469	33,726	36,607	37,303	61,541	NaN	NaN	NaN	0.64	NaN	NaN	NaN
Total excises (non calibrated) (ils_extstat_ittncal_il_itt_excnc)													
Revenues Excises 0211 - Spirits (il_tx0211)	Y	0	0	0	0	2,089	NaN	NaN	NaN	0.00	NaN	NaN	NaN
Revenues Excises 0213 - Beer (il_tx0213)	Y	0	0	0	0	586	NaN	NaN	NaN	0.00	NaN	NaN	NaN

	Simulated	EUROMOD				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Revenues Excises 022 - Tobacco (il_tx022)	Y	5,474	5,861	6,152	6,237	14,714	NaN	NaN	NaN	0.37	NaN	NaN	NaN
Revenues Excises 045 - Energy (electricity, natural gas, coal-coke) (il_tx045)	Y	6,293	5,173	4,739	4,882	9,712	NaN	NaN	NaN	0.65	NaN	NaN	NaN
Revenues Excises 0451 - Electricity (il_tx0451)	Y	2,385	2,409	2,066	2,207	6,691	NaN	NaN	NaN	0.36	NaN	NaN	NaN
Revenues Excises All Energy (il_tx045_072)	Y	32,640	26,488	29,120	29,706	43,812	NaN	NaN	NaN	0.75	NaN	NaN	NaN

Table A3.10. Consumption taxes (calibrated) - Annual amounts (millions)

	Simulated	EUROMOD				External				Ratio			
	(Y / N)	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Consumption-tax-related statistics calibrated (ils_extstat_ittcal)													
Revenue from indirect taxes (calibrated) (il_itt_revc)													
VAT Total Revenue (il_tva_na)	Y	153,928	170,583	178,156	193,250	260,333	289,641	286,587	NaN	0.59	0.59	0.62	NaN
Excises Total Revenue (il_tx_na)	Y	50,088	44,933	48,777	48,647	61,541	NaN	NaN	NaN	0.81	NaN	NaN	NaN
Total excises (calibrated) (il_itt_excc)													
Revenues Excises 0211 - Spirits (il_tx0211_na)	Y	0	0	0	0	2,089	NaN	NaN	NaN	0.00	NaN	NaN	NaN
Revenues Excises 0213 - Beer (il_tx0213_na)	Y	0	0	0	0	586	NaN	NaN	NaN	0.00	NaN	NaN	NaN
Revenues Excises 022 - Tobacco (il_tx022_na)	Y	12,497	12,274	12,970	12,898	14,714	NaN	NaN	NaN	0.85	NaN	NaN	NaN
Revenues Excises 045 - Energy (electricity, natural gas, coal-coke) (il_tx045_na)	Y	6,559	5,501	5,072	5,135	9,712	NaN	NaN	NaN	0.68	NaN	NaN	NaN
Revenues Excises 0451 - Electricity (il_tx0451_na)	Y	2,486	2,562	2,211	2,321	6,691	NaN	NaN	NaN	0.37	NaN	NaN	NaN
Revenues Excises All Energy (il_tx045_072_na)	Y	34,497	29,776	32,991	32,938	43,812	NaN	NaN	NaN	0.79	NaN	NaN	NaN

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