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UKMOD – United Kingdom (UK) Country report 2020-2026

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UKMOD

COUNTRY REPORT

UNITED KINGDOM (UK)
2020-2026

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UKMOD version B1.07

UKMOD is a tax-benefit model for the UK and its constituent nations. It uses the EUROMOD platform. For more information on UKMOD visit https://www.microsimulation.ac.uk/ukmod researchers and policy analysts to calculate the effects of taxes and benefits on household incomes and work incentives for the UK as a whole or for the population of the each of its nations. This is done in a comparable manner with other models using the EUROMOD platform.

UKMOD is updated to recent policy systems using data from the Family Resources Survey (FRS) as the input database.

This report documents the work done in one annual update. This work was carried out by the UKMOD developer team, based at ISER at the University of Essex.

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The results presented in this report are derived using UKMOD version B1.07. UKMOD is continually being improved and the results presented here may not match those obtained with later model versions.

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1 BASIC INFORMATION

1.1 Basic information about the tax-benefit system

a) The tax-benefit system is largely a unified, national system. The main exceptions are[1]:
   - *Council Tax* and *Council Tax Reduction* which do not apply in Northern Ireland;
   - a discretionary *Social Fund* managed under fixed local budgets each year;
   - Scottish non-savings/non-dividend income taxes applicable from 2016;
   - and selected family and social benefits applicable in Scotland from 2018.

b) The financial year used to assess taxes and benefits in the UK is from April to March, and this document refers to years in the same way. Furthermore, most benefit changes also occur at the beginning of April, but reforms can occur at other times of the year, particularly in June or October.

c) The State Pension age for women started to increase gradually from 2010 when it was 60 years old, until it reached 65 years old in December 2018. A phased increase of the State Pension age for both men and women started in March 2019, with State Pension age planned to increase to 68 by March 2046.[2]

d) Minimum school leaving age is 16; dependent children are usually defined as being under 16 or under 19 years old and in full-time non-advanced education and not married.

e) The Income Tax system is an individual system, with spouses being assessed independently.

f) Income Tax liability is based on annual income and allowances and thresholds are referred to in annual terms. Income Tax withholdings are collected on a cumulative basis, i.e., the system tries to ensure withholding the exact amount due in the financial year. Only individuals paying tax on trading income (e.g. self-employed people), income from more than one job, or people who pay tax at a higher marginal rate must file a tax return for Income Tax. Typically, end-year adjustments to tax liability are factored into the next year's tax code.

g) The means-tested benefit system assesses entitlement according to benefit unit income. The benefit unit is the nuclear family – a single adult or partner couple (cohabiting or married) and their dependent children (*tu_bu_uk*). Social contributions, state benefits and pensions are usually assessed and paid on a weekly basis. Amounts are referred to in weekly terms.

h) For benefit and tax credit purposes, lone parents are defined as parents of resident dependent children, not cohabiting with a partner of the opposite sex (whether any partner is the parent of the child is irrelevant).

[1] The system can vary in practice across regions and by other characteristics. Welsh income taxes were also devolved from 2019 but have not yet varied from the rest of the UK.

[2] UKMOD simulates State Pension age on an annual basis. The model assumes that State Pension age for women increased from 60 to 61 in 2012, to 62 in 2014, 63 in 2016, 64 in 2017, and 65 in 2019. State Pension age for both men and women is then assumed to increase to 66 from 2021, to 67 from 2028, and to 68 from 2046.

i) Generally, civil partners (same sex) are treated in the same way as married couples by the tax-benefit system.

j) There are statutory requirements to uprate some elements of the tax-benefit system annually, while for others uprating is discretionary. Until 2011 most components were uprated annually in line with price growth (RPI), with means-tested benefits following the "Rossi" price index[3] excluding housing costs and local taxes. From 2011 the CPI (from the previous September) was used as the basis for price uprating of benefits and tax credits, from 2012 also for Income Tax allowances and thresholds and from 2022 for (most) National Insurance limits, thresholds, and rates. On average the CPI rises more slowly than either the RPI or the Rossi index. Only a few elements are adjusted in line with earnings growth, and some are not adjusted at all. Each year there may be announced departures from these rules, in either direction.

k) Policy changes, or confirmations of standard uprating, are announced since 2017 in the UK's Autumn Budget (usually in November) for the following April. Further changes may also be announced in the Spring Statement (usually in March or April) when the Government also responds to the Office for Budget Responsibility's (OBR) forecasts. Often, structural changes are announced one or more years ahead of planned implementation. For example, the introduction of an element of joint taxation (a transferable allowance between spouses) for April 2015 was announced in December 2013. The Scottish budget is announced usually in December.

1.2 Social benefits

In the UK, social security benefits can be divided into three different types: *contributory*, *non-contributory (non-means-tested)* and *means-tested*.

The first category consists of ***contributory*** benefits, which are earnings-replacement benefits and pensions. Entitlement to these benefits depends on having met certain conditions regarding National Insurance contributions. Some contributory benefits are subject to specific tests on current income.

The second category consists of ***non-contributory (non-means-tested)*** benefits. These benefits depend on certain contingencies such as disability or (lone) parenthood but do not require contributions to have been made and are not subject to an income test.

The third category consists of ***means-tested*** benefits. These benefits depend on a range of personal and family circumstances but also on family incomes – benefit entitlement is reduced if family incomes increase.

Tax credits, despite being administered by the tax authorities rather than the Department for Work and Pensions, share similar features to cash benefits and are treated as such here. Each of the three types of benefits are reviewed in the next section. Table 1.1 provides an overview of different benefits by type:

[3] "Rossi" price index, named after Hugh Rossi, the social security minister responsible for its introduction, corresponds to the all-items RPI excluding rent, mortgage interest payments, council tax and depreciation costs. It was also the index used to uprate state income-related benefits.

Table 1.1 Types of Benefits in the UK tax-benefit system

Contributory	Bereavement benefit Employment and Support Allowance (ESA, contributions-based) Jobseeker's Allowance (JSA, contributions-based) Maternity Allowance (MA) State retirement pensions
Non-contributory, non-means-tested	Attendance Allowance (AA) Carer's Allowance (CA) Disability Living Allowance (DLA) Guardian's Allowance Industrial Injuries Disablement Benefit Personal Independence Payment (PIP) Scottish Carer's Allowance Supplement Scottish Child Winter Heating Assistance Severe Disablement Allowance (SDA) War Pensions Winter Fuel Allowance
Means-tested	Best Start Foods (Scotland) Best Start Grant (Scotland) Child Benefit (CB) Child Tax Credit (CTC) Cost of Living Payment (CLP) Council Tax Reduction (CTR) Discretionary Housing Payment (DHP) Employment and Support Allowance (income-based) Free School Meals Healthy Start (food) voucher Housing Benefit (HB) Income Support (IS) Jobseeker's Allowance (income-based) Local Housing Allowance (LHA) Pension Credit (PC) School Clothing Grant Scottish Child Payment Social Fund Sure Start Maternity Grant Universal Credit (UC) Working Tax Credit (WTC)
Other (not strictly) benefits	Child support Coronavirus Job Retention Scheme (CJRS) Foster Allowances Private pensions Self-Employment Income Support Scheme (SEISS) Statutory Maternity Pay (SMP) Statutory Paternity Pay (SPP) Statutory Sick Pay (SSP) Student loans Training allowances and Education Maintenance Allowance

1.2.1 Contributory benefits

Also known as "National Insurance benefits", the main contributory benefits are:

Bereavement benefit is based on the late spouse's contributions; widow(er)s under 45 do not qualify unless they have dependent children. Bereavement benefit is taxable. Part of any additional state or private pensions of the spouse can also usually be inherited.

Employment and Support Allowance (ESA) is a benefit for the sick and long-term incapacitated, conditional on the claimant's inability to do paid work. From 2008 this replaced Incapacity Benefit and the disability element of Income Support (IS). The contributory part (as well as the means-tested part – see section 1.2.3) involves an initial assessment phase of 13 weeks during which a basic allowance is paid. The assessment focuses on capability to work. If claimants are assessed as having a limited capability for work-related activity, they are moved on to the support component, which means receiving a higher rate with no additional conditions. If claimants are assessed to have a capability for work-related activity (WRAG), they receive the work-related activity supplement and must participate in regular work-focussed interviews. From 2012 contributions-based ESA for those on WRAG is limited to a period of 12 months.

Jobseeker's Allowance (JSA) is a benefit for the unemployed, conditional on active job search. The contributory part has no additions for dependants. Duration of the contributory allowance is up to six months only. Small earnings are disregarded, and it is paid only for those under the respective State Pension age. It is taxable. There is also a means-tested component to JSA (see section 1.2.3 below).

Maternity Allowance (MA) is a flat-rate benefit payable for up to 26 weeks if the claimant has herself met contribution, employment and earnings conditions and does not qualify for Statutory Maternity Payment (SMP, see section 1.2.4). A standard rate is paid to women whose average earnings at least equal the National Insurance lower earnings limit and to self-employed women who have paid a Class 2 contribution (see section 1.3). Maternity Allowance is not taxable.

State retirement pensions are paid to individuals from State Pension age who meet associated contribution conditions. The **basic State Pension** is a flat rate benefit ("Category A"). If conditions are only partly met, a reduced pension worth at least 25% of the full basic State Pension can be paid. Spouses who do not meet the contributory conditions may receive a lower pension based on their partner's contributions ("Category B"). At age 80 contribution conditions are removed. Extra pension increments can be earned if retirement is delayed, and additions are paid for dependent spouses under pension age. The basic State Pension is taxable. For pensioners who contributed to **additional State Pensions** (the State Earnings Related Pension Scheme, State Second Pension) an additional earnings-related pension is payable. These additional State Pensions are also taxable and there are no additions for dependants.

1.2.2 Non-contributory, non-means-tested benefits

Attendance Allowance (AA) is a flat-rate benefit and can be claimed by individuals who need care during the day, at night or both (higher rate) due to their illness or disability. It is taxable. In Scotland, from 2022 it was be replaced by the Pension Age Disability Payment but has remained broadly like Attendance Allowance.

Carer's Allowance (CA) is a benefit for carers of severely disabled people who are themselves not earning more than a specific threshold and are aged 64 or less when first claiming. Severe disability is defined as someone getting either the DLA care component or AA. It is taxable and there are additions for dependents.

Disability Living Allowance (DLA) can be claimed by individuals if they become disabled before the age of 65 and have personal care and/or mobility needs. The care component is paid at one of three rates and the mobility component at one of two rates, depending on severity of need. DLA is not taxable. This allowance is being gradually replaced by the Personal Independence Payment (PIP) for working-age adults. In Scotland, from 2022 DLA Child payments were replaced by the Child Disability Payment.

Guardian's Allowance is paid to someone bringing up children whose parents have died. It is paid in addition to Child Benefit and is not taxable.

Industrial Injuries Disablement Benefit is a benefit for people who are long-term incapacitated due to injury at work. It is not taxable.

Personal Independence Payment (PIP) has been gradually introduced across the country from summer 2013 for new claimants of DLA aged 16-64. It is very similar to DLA as it is not means-tested, non-contributory and non-taxable. It aims to help working-age adult with some of the extra costs caused by long-term disability or ill-health. As for DLA, PIP has two components – a living component and a mobility one. Each component has two rates: a standard rate and an enhanced rate. From 2022, PIP for disabled people of working age was replaced by the Adult Disability Payment.

Scottish Carer's Allowance Supplement is an extra payment for people in Scotland who get Carer's Allowance. It was first paid in December 2018.

Scottish Child Winter Heating Assistance is a payment, first provided in 2020, that is made once a year to help disabled children and young people and their families with increased heating costs during winter.

Severe Disablement Allowance (SDA) can be claimed by individuals who are at least 80% disabled but who do not qualify for ESA. It is paid at a lower rate and there are additional payments for dependents. SDA is not taxable. Since April 2002, the benefit is only maintained for existing claimants.

War Pensions is an umbrella term for a series of payments made to people who have been injured, disabled, or widowed due to service in HM Forces (not necessarily in a war). War Pensions are not taxable.

Winter Fuel Allowance is an annual payment made to households containing at least one person over State Pension age, with a supplement paid for the presence of anyone aged over 80. The payment is not taxable and is not means-tested.

1.2.3 Means-tested benefits

Best Start Foods (BSF) replaces the Healthy Start voucher in Scotland from 2019. The benefit provides a payment card to purchase selected food products. It is payable to families with children under 3 who are in receipt of qualifying benefits, subject to associated income limits.

Best Start Grant (BSG) is like SSMG, available for pregnant women usually resident in Scotland. In addition to a pregnancy (and baby) payment, the Best Start Grant includes amounts to help with the costs of young children (early learning and school-age payments).

Child Benefit (CB) is a universal flat-rate benefit paid to the carer of each dependent child (under 16 or under 19 and in full-time education or training). There is a higher rate for the eldest or only dependent child; otherwise, the rate does not vary. Child Benefit is not generally taxable, and has been subject to a means-test since 2013.

Child Tax Credit (CTC) is payable to families with children, regardless of whether the parents are in work. The transfer is made up of two components. The first component is a “family element” (in some years doubled for the first year following a child’s birth. The second component is a per-child payment (higher if the child is disabled) up to two children (“two-child limit”) for those families with a gross annual income up to a given threshold and is tapered off thereafter as income increases. It is payable and assessed on a yearly basis and is not taxable. It has been replaced by Universal Credit for most people.

Cost of Living Payment (CLP) discrete payments offered to people in receipts of qualifying (means-tested) benefits in 2022 and 2023 to off-set unanticipated rises in inflation. For further details of this scheme, see Annex 6.5.1.

Council Tax Reduction (CTR, sometimes referred to as Council Tax Support) provides rebates on Council Tax for low-income households. It has a similar structure to HB and is not taxable and is discretionary at the local authority level. From 2013 CTR replaced Council Tax Benefit.

Discretionary Housing Payment (DHP) may be made to residents in Scotland to help with the costs of accommodation. DHP are typically limited to recipients who claim Housing Benefit/Universal Credit where the benefits do not already cover all costs of housing.

Employment and Support Allowance (income-based) is the social assistance benefit for the long-term sick and disabled which may be claimed after entitlement to contributions-based JSA is exhausted or on top of it, to meet the income needs of an incapacitated person and their family. The structure is like that for *Income Support* (see section 2.5.12).

Free School Meals (FSM) are provided to school children who are in families that receive qualifying benefits, subject to associated income limits. Free school lunches are provided to all children during the first three years of primary school in England, and primary 1 to 5 in Scotland. Schools maintained by the local authority in Wales provide free school breakfasts.

Healthy Start voucher (HSV) is a weekly voucher payable to pregnant women and people with parental responsibilities for children under age 4. The voucher can be used to purchase qualifying food products and is payable to people in families where at least one member is entitled to a qualifying benefit. Cash payments are made if the family residence is not located near a registered food provider. In Scotland, HSVs were replaced by Best Start Foods from 2019.

Housing Benefit (HB) covers rent for social renters. It is paid in full for IS, PC-GC and income-based JSA and ESA recipients, subject to locally specified maxima. For those with higher incomes it is tapered away with additional income, using a similar system to IS. HB is assessed on weekly income and rent and is not taxable.

Income Support (IS) was the main social assistance benefit, before introduction of Universal Credit (see section 2.5.25), for working-age people whose family incomes are lower than a specified level, who are exempt from the obligation to find work (or are in work for less than 16 hours per week), and are not covered by income-tested ESA or JSA (see sections 2.5.8 and 2.5.14). If family income is less than the applicable amount, IS makes up the shortfall. The applicable amount is made up of personal allowances and premiums for certain groups with special needs. Amounts for children are provided through *Child Tax Credit* (see section 2.5.5) which is paid at the maximum level. Some housing costs (mortgage interest and ground rent) are included in the applicable amount. Families who share their household with other non-dependent adults have deductions made from the amount allowed for housing costs, regardless of whether actual contributions to the cost are made. Rent and Council Tax are not included but are covered separately by *Housing Benefit* and *Council Tax Reduction*. Income is assessed after tax and contributions; instead of actual income from capital, a “tariff” income is calculated from capital above a lower limit. Families with more than a certain amount of financial capital are disqualified from IS altogether. IS is assessed weekly and is not taxable. Certain benefits-in-kind (so called 'passported' benefits) are available to recipients of IS. These include free lunches for school children; free prescription medicines (these are already free to all children and pensioners); free milk for babies and pregnant women.

Jobseeker's Allowance (income-based, JSA) is the social assistance benefit for the unemployed which may be claimed after entitlement to contributions-based JSA is exhausted or on top of it, to meet the income needs of an unemployed person and their family. The structure is the same as for *Income Support* (see section 2.5.12).

Local Housing Allowance (LHA) provides help with private rent for low-income households, replacing HB for these households gradually between 2008 and 2013. It has a similar structure to HB (assessed on weekly income and rent) limiting the amount that can be claimed against housing costs by private sector tenants. The amount of the benefit is linked to a percentile of rent within a local Broad Rent Market Area (BRMA) for similar dwellings. Moreover, the amount of the benefit payable is subject to a national maximum distinguished by the size of the accommodation.

Pension Credit (PC) is the means-tested pension for people over State Pension age and is made up of two parts. The Guarantee Credit (PC-GC) is like IS in structure. The Savings Credit (PC-SC) is designed to reduce the effective withdrawal (claw-back) rate of Pension Credit on income earned above the basic State Pension below 100% implied by the Guarantee Credit alone. It is not taxable.

School Clothing Grant (SCG) provides help with the costs of a child's school clothing. Although SCG is the name of a program that is specific to Scotland, the term is used here to refer to similar payments available throughout the UK (School Essentials Grant in Wales, School Uniform Grants in Northern Ireland). These payments are administered by local councils and authorities and are provided on a similar means-tested basis to Free School Meals.

Scottish Child Payment (SCP) is available for families in Scotland that include children under the age of six or, from 14 November 2022, age 16. The benefit is payable to families in receipt of means-tested benefits or tax credits, is non-contributory, and not taxable.

Social Fund payments also include two components – regulated payments which contribute to maternity, funeral, and cold-weather fuel costs for certain families on low income; and discretionary payments which take the form of either non-repayable grants or interest-free loans.

Sure Start Maternity Grant (SSMG) is a one-off payment from the Social Fund for low-income families to help with the cost of a new baby. In Scotland, from late 2018 this was replaced by the Best Start Grant.

Universal Credit (UC) has been phased-in since October 2013 and its full roll-out should be complete by September 2024. It represents a very substantial reform to the system of means-tested benefits and tax credits for working-age families. The core of the reform is that almost all means-tested welfare benefits (Income Support, Jobseeker's Allowance, Employment and Support Allowance and Housing Benefit) and in-work tax credits (Child Tax Credit and Working Tax Credit) are combined into a single programme, Universal Credit. It is payable to families where no one is in work, and to families on a low income where someone is in work. The stated motivation for UC was that it will simplify benefit claims, make the gains from work more transparent, and reduce the amount spent on administration, fraud, and error. Conditionality under UC applies to two groups of Universal Credit recipients who previously faced no forms of conditionality: some part-time workers face obligations to seek better-paid or longer working hours, and some adults without paid work whose partners are in low-paid work face obligations to look for paid work.

Working Tax Credit (WTC) is designed to top-up the wage of low-paid workers, which has been replaced for most people by Universal Credit. WTC is payable to:

1. people aged 25 or over in employment or self-employment for at least 30 hours per week,
2. people with disabilities working at least 16 hours per week, and
3. to families with dependent children where at least one parent is in employment or self-employment for at least 16 hours per week.[4]

Working Tax Credit is payable and assessed on a yearly basis but is responsive to changes in household circumstances and income. Recipients are required to report changes in income which can lead to a re-assessment of their tax credit award. WTC contains an element to cover a proportion of qualifying childcare costs. It is not taxable.

1.2.4 Not strictly benefits

In addition, there are components of income that are not strictly part of the benefit system. These include:

Child Support is child maintenance paid by absent parents (*yptmp*). It depends on an assessment of income and needs of the families of both parents and is enforced where lone parents are on Income Support**.**

Coronavirus Job Retention Scheme (CJRS) or "furlough scheme" was introduced in April 2020 as an earnings subsidy to support employees during the coronavirus pandemic and the lockdown and social distancing measures introduced to combat it. It covered 80% of earnings (up to maximum of £2,500) and ended in September 2021. For further information about this scheme, see Annex 6.5.2.

Foster Allowances are paid to families looking after children who are in Local Authority care (or similar).

Private Pensions, comprising occupational (employer-provided) and approved personal pensions, private pensions are accrued to provide for retirement by most employees in the UK.

Self-Employment Income Support Scheme (SEISS) was introduced in May 2020 as an earnings subsidy to support self-employed people who had business disrupted during the coronavirus pandemic. It was paid in five lump sums in May, August, November 2020 and February and May 2021 to eligible workers based on an average of profits in previous three/four years. For further information about this scheme, see Annex 6.5.2.

Statutory Maternity Pay (SMP) and **Statutory Paternity Pay (SPP)** (starting from 5 April 2015) payable to employees by the employer for the first 39 weeks of maternity leave. For SMP there is a minimum flat rate payment and a higher rate (payable for only six weeks) equal to 90% of usual earnings. SMP and SPP payments are (generally) treated as earnings by the rest of the tax-benefit system.

Statutory Sick Pay (SSP) payable to employees by the employer for the first 28 weeks of sickness leave. SSP is paid at a flat rate (most employers pay full wages for short-term sickness). Payments are (generally) treated as earnings by the rest of the tax-benefit system.

[4] Specific hour limits may vary over time.

Student Loans are loans provided by the government to pay for tertiary or college education in the UK. The loans are paid directly to the education provider, are subject to an upper cap, and are partly means-tested on parental income.

Training Allowance and Education Maintenance Allowance payments are paid under various schemes that are beyond the scope of the current report.

1.2.5 Benefit cap

From 15 April 2013, a "benefit cap" may limit the total amount payable to a benefit unit from selected benefits. The benefit cap is applied by reducing HB or, from October 2013, by reducing Universal Credit. If the benefit unit is not entitled to HB or UC, the benefit cap is not applied.

1.3 Social contributions

Social contributions, known as *National Insurance Contributions (NICs)*, provide entitlements to National Insurance (NI) benefits and NI basic State Pension. Although NICs were initially designed to finance NI benefits, the link between the two has become notional over time. There are four classes of contributions, but the most important in terms of revenue-raising is Class 1, which makes up 97% of the total.

Employees pay "primary" Class 1 contributions on their current weekly earnings between a lower and upper earnings limit (and at a lower rate above this limit) and employers pay "secondary" Class 1 contributions on the same earnings base but with no upper limit. Some employer-provided goods in kind (such as company car) are included in the earnings base.

People with self-employment income are liable for Class 2 and Class 4 contributions. These contributions only bring entitlement to the basic State Pension, not to short-term benefits. Class 2 contributions are a weekly payment at a flat rate, which is the equivalent of employee Class 1 contributions. Low self-employment income is exempt. The equivalent of the employer contributions are the Class 4 contributions. These are payable on income between a lower and upper profits limit (and at a lower rate above this limit) and are determined annually. There is a maximum annual NIC payment for those with both employment and self-employment income which corresponds to the maximum that can be paid in a full year on employment earnings. The same maximum applies to people with earnings from several jobs.

Until 2016, employees could choose to pay a lower rate of NICs by contracting out of the additional State Pension (SERPS or S2P) and elect to pay these contributions to an 'appropriate personal pension'. Married women who had chosen to pay reduced NICs prior to 1977 could also continue to do so, for so long as their contribution records have been maintained. This means they do not have to pay Class 2 contributions (if self-employed) and are subject to a lower rate of Class 1 contributions (if employed). A woman who does this can claim a reduced Category B State Pension based on her husband's contributions on retirement, and they are not eligible for other contributory benefits.

Class 3 contributions are voluntary and are usually made by UK citizens living abroad to maintain their contribution record.

Minimum contributions may be credited in certain circumstances, notably during registered unemployment and while caring for young children at home.

National Insurance contributions are not tax-deductible.

1.4 Taxes

Income Tax. The UK Income Tax system is an individual system, with the incomes of married people being taxed independently. There is an individual Personal Tax Allowance which is higher for people aged over 65 and still higher for those aged over 75 (“Age Allowances”). Age additions are withdrawn as taxable income rises. From April 2015 age additions allowances are gradually phased out and the unused Personal Tax Allowance can be transferred within non-higher taxpayer married couples. From 6 April 2016, a new Personal Savings Allowance has been introduced.

The UK Income Tax system has a relatively broad base and there is – for all practical purposes – a unified tax schedule. Some employer-provided goods in kind are included in the income base (such as company cars). Tax rates are progressive, levied in a multi-step form that increases with higher income bands. From April 2016 income tax rates and bands were devolved to the Scottish Government, and from April 2019 income tax rates were devolved to the Welsh Government.

Tax Assessment is annual (April - March). Most Income Tax is collected at source, either through withholding at 20% on income from capital or through the comprehensive and cumulative Pay As You Earn (PAYE) system on earnings. Most UK income taxpayers do not complete tax returns: only those who may be liable for higher-rate tax usually do so. Otherwise, most adjustments are carried out within the tax year using the PAYE system or between years using the tax code.

Council Tax is a local tax providing approximately 20% of local revenue. It replaced the poll tax in 1993. Council Tax does not apply in Northern Ireland where the system of domestic rates remains in place. Council Tax is mainly based on the estimated market value of the property (as of April 1991). Properties are allocated to one of nine bands according to property value, which vary across the constituent nations. The tax in each band is some multiple of the tax in the 4th band (“Band D”), ranging from 2/3 in the lowest value band to 2 in the top value band. Local authorities set the level of Band D tax each April. The Council Tax is reduced by 25% if the property contains only one resident adult (or by 50% if there is nobody resident). There are exemptions for students and members of the Armed Forces. The tax has its own rebate system for low-income families (Council Tax Reduction - see section 2.5.6).

Capital Gains Tax is levied on gains arising from the disposal of assets by individuals, representatives, and trustees. There is an allowance on which an individual’s capital gain is exempt from tax (the allowance for trusts is lower). There is a taper system which reduces the proportion of the gain that is chargeable to tax, the longer the asset has been owned.

Inheritance Tax is charged at a single rate of 40% on wealth transferred at (or within seven years before) death. There is a minimum threshold and certain assets such as farms and small businesses are eligible for relief. Transfers to spouses and charities are exempt.

Property and Stamp Duties (Stamp Duty and Stamp Duty Land Tax) are levied on stock and share transactions and on conveyances and transfers of land and property. There is a threshold below which no duty is payable, and a scale of proportional rates applies to property transactions, according to the value of the property.

2 SIMULATION OF TAXES AND BENEFITS IN UKMOD

2.1 Scope of simulation

Not all the taxes and benefits mentioned in the previous section are simulated by UKMOD. Some are beyond its scope entirely and are neither included in the UKMOD database nor in its output. Others are not possible to simulate accurately with the available data. They are included in the database and may be accommodated as components of output variables, but the rules governing them may not be changed by the model.

Table 2.1 shows which benefits are simulated (or otherwise treated) whereas Table 2.2 shows which taxes and contributions are simulated. See also Annex 6.3 for a description of key UKMOD income variables and concepts.

Table 2.1 Simulation of Benefits in UKMOD

benefit name	variable name(s)	simulation year 2020	2021	2022	2023	2024	2025	2026	description
Contributory (National Insurance) benefits									
Bereavement Benefit	bsuwd	I	I	I	I	I	I	I	No data on deceased husband's contributions or date of widowhood
Employment and Support Allowance (contributions-based)	bdict01, bdict02	I	I	I	I	I	I	I	Inadequate data on length of sickness spell and contribution history
Jobseeker's Allowance (contributions-based)	bunct_s	PS/S	PS/S	PS/S	PS/S	PS/S	PS/S	PS/S	Eligibility for unemployment benefit is based on actual receipt plus other relevant conditions being satisfied. A full simulation of unemployment benefit receipt can be switched on.
Maternity Allowance(*)	bmana, bmanc_s	I	I	I	I	I	I	I	No data on pregnancy dates, contribution conditions, previous earnings.
State Pension - basic	boact00	I	I	I	I	I	I	I	Contribution history unknown
State Pension - additional	boactcm	I	I	I	I	I	I	I	Contribution history unknown
Non-contributory, non-means tested									
Attendance Allowance	bdioa	I	I	I	I	I	I	I	Insufficient information on disability
Carer's Allowance	bcrdi	I	I	I	I	I	I	I	Insufficient information on disability
Disability Living Allowance	bdisc, bdimb	I	I	I	I	I	I	I	Insufficient information on disability
Guardian's Allowance		E	E	E	E	E	E	E	Low statistical incidence - modelled in common with natural parents
Industrial Injuries Disablement Benefit	bdiwi	I	I	I	I	I	I	I	Insufficient information on disability
Personal Independence Payment	bdiscwa, bdimbwa	I	I	I	I	I	I	I	Insufficient information on disability

Notes: "-": policy did not exist in respective 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 rules (usually eligibility) not simulated; "S" simulated.
(*) For consistency across time, the baseline uses non-simulated variables as reported from FRS and uprated in line with Government announcements. For 2015 system onwards, Maternity Allowance (bmanc_s) and Statutory Maternity/Paternity Pay (bmact_s and bpact_s) can also be simulated using the Parental Benefits switch.

Table 2.1 Simulation of Benefits in UKMOD (continued)

benefit name	variable name(s)	simulation year							description
		2020	2021	2022	2023	2024	2025	2026	
Non-contributory, non-means tested									
Scottish Carer's Allowance Supplement	bcrdicm_s	PS	PS	PS	PS	PS	PS	PS	Eligibility for entitlement is based on actual receipt of CA and region of residence.
Scottish Child Winter Heating Assistance	bchht_s	S	S	S	S	S	S	S	From winter 2020
Severe Disablement Allowance	bdisv	I	I	I	I	I	I	I	Insufficient information on disability
War Pension	boawr	I	I	I	I	I	I	I	Insufficient information on injury
Winter Fuel Allowance	boaht_s	S	S	S	S	S	S	S	
Means-tested									
Best Start Foods	bmascmt01_s	S	S	S	S	S	S	S	Scotland from 2020
Best Start Grant	bmascmt_s	S	S	S	S	S	S	S	Scotland from 2019
Child Benefit	bch_s, bchrd_s	S	S	S	S	S	S	S	
Child Tax Credit	bfamt_s	S	S	S	S	S	S	S	
Cost of Living Payment	bsaec_s	-	S	S	-	-	-	-	
Council Tax Reduction	bmu_s	S	S	S	S	S	S	S	From 2013 administered at local level - this heterogeneity not reflected by model.
Discretionary Housing Payment	bhosc01_s	S	S	S	S	S	S	S	
Employment and Support Allowance (income-based)	bsadi_s	S	S	S	S	S	S	S	
Free School Meals	bched01_s	S	S	S	S	S	S	S	from 2017
Healthy Start (food)	bmamt01_s	S	S	S	S	S	S	S	from 2006
Housing Benefit	bho_s	S	S	S	S	S	S	S	
Income Support	bsa_s	S	S	S	S	S	S	S	
Jobseeker's Allowance (income-based)	bunmt_s	S	S	S	S	S	S	S	Simulated as part of Income Support

Notes: "-": policy did not exist in respective 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 rules (usually eligibility) not simulated; "S" simulated.

Table 2.1 Simulation of Benefits in UKMOD (continued)

benefit name	variable name(s)	simulation year							description
		2020	2021	2022	2023	2024	2025	2026	
Means-tested									
Local Housing Allowance	bho_s	S	S	S	S	S	S	S	
Pension Credit	boamt_s	S	S	S	S	S	S	S	
School Clothing Grant	bched02_s	S	S	S	S	S	S	S	from 2017
Scottish Child Payment	bchmt_s	-	S	S	S	S	S	S	From February 2021
Social Fund		E	E	E	E	E	E	E	No data; cannot model local discretion
Sure Start Maternity Grant	bmamt_s	S	S	S	S	S	S	S	
Universal Credit	bsauc_s	S	S	S	S	S	S	S	Replacing other means-tested benefits gradually from late 2013
Working Tax Credit	bwkmt_s	S	S	S	S	S	S	S	
Other benefits									
Child support	yptmp	I	I	I	I	I	I	I	
Coronavirus Job Retention Scheme	bwkmcee_s, yemmc_s	S	S	-	-	-	-	-	In 2020 and until September 2021
Foster Allowances	yptot	I	I	I	I	I	I	I	
Private pensions	ypp	I	I	I	I	I	I	I	Data available for pensions in payment, but otherwise not for accrued rights
Self-Employment Income Support Scheme	bwkmcse_s	S	S	-	-	-	-	-	From May 2020 and until September 2021
Statutory Maternity/Paternity Pay(*)	bmaer (bmact_s)	I	I	I	I	I	I	I	No data on pregnancy dates or previous employment record or earnings.
Statutory Sick Pay	bhlwk	I	I	I	I	I	I	I	No data on qualifying conditions
Student loans	bedsl	I	I	I	I	I	I	I	Insufficient information on school attendance
Training and educational maintenance allowances	bedes	I	I	I	I	I	I	I	Insufficient information on school attendance

Notes: "-": policy did not exist in respective 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 rules (usually eligibility) not simulated; "S" simulated.
(*) For consistency across time, the baseline uses non-simulated variables as reported from FRS and uprated in line with Government announcements. For 2015 system onwards, Maternity Allowance (bmanc_s) and Statutory Maternity/Paternity Pay (bmact_s and bpact_s) can also be simulated using the Parental Benefits switch.

Table 2.2 Simulation of Taxes and Social Contributions in UKMOD

tax name	variable name(s)	simulation year							description
		2020	2021	2022	2023	2024	2025	2026	
Income tax	tin_s	S	S	S	S	S	S	S	Some exemptions and small allowances are ignored.
National Insurance contributions	tscee_s, tscse_s, tscer_s	S	S	S	S	S	S	S	Special schemes for small groups are ignored.
Council Tax	tmu	I	I	I	I	I	I	I	No data on property value; no location information below standard region.
Private pension contributions	tpcee_s	PS	PS	PS	PS	PS	PS	PS	Implicit rate calculated from recorded contribution and earnings
Capital Gains Tax		E	E	E	E	E	E	E	No data of capital gains
Inheritance Tax		E	E	E	E	E	E	E	No data on inheritances received
Property and Stamp Duty		E	E	E	E	E	E	E	No data on property transactions

Notes: "-": policy did not exist in respective 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 rules (usually eligibility) not simulated; "S" simulated.

2.2 Order of simulation and interdependencies

Table 2.3 shows the order in which the main elements of the UK system are simulated.

The model starts with a series of inputs and definitions that underly each simulation. These include definition of model constants, default values for simulated variables including random variables used to simulate population heterogeneity, specification of assessment units, and definition of key income concepts (policies 1 to 13).

Private income is a key determinant of both taxes and benefits in the model. The next series of policies consequently adjust the definition of income to account for minimum wage rates (policy 14), Covid-related income subsidies (15 to 17), private pension contributions (18), and lower bounds to self-employment income for assessment purposes (19, 20). Local housing allowances are then calculated (21), followed by maternity and paternity pay and allowances (22 to 24), and then the carer's allowance supplement for Scottish residents (26).

Next, employee and self-employed National Insurance contributions (27) are simulated followed by National Insurance contributions for employers (28). After the simulation of NICs, contributions-based unemployment benefit JSA (29) is simulated. This is done because contributions-based JSA payments are both taxable and taken into consideration by the means-tests applied by benefits evaluated later by the model. The simulation of Winter Fuel Allowance (30), Child Benefit (31), Income Tax Allowance (32) and personal Income Tax (33) are evaluated next, followed by the reduction of the Child Benefit for high earners (34). Child benefit is evaluated early in the simulation because associated payments are considered by means-tested benefits calculated later by the model. Working Tax Credit and Child Tax Credit are evaluated on a similar definition of gross income as income taxes and national insurance contributions and are consequently calculated next (35).

Having evaluated income net of taxes, national insurance contributions, contributions-based JSA and Child Benefit, the model is now able to evaluate Income Support, income-based JSA, Pension Credit (36) and income-based Employment and Support Allowance (37). Housing Benefit (38) and Council Tax Reduction (40) include CTC and WTC in their means-test, and their calculation depends on whether Income Support (including income-based JSA, Pension Credit and income-based ESA) is received. Therefore, they are simulated after other means-tested benefits.

Universal Credit (UC) (39) is independent from other means-tested benefits for working-aged people. However, to allow for consistency of take-up behaviour with legacy (before UC) benefits, UKMOD first computes all the means-tested benefits replaced by UC and then computes UC. Nevertheless, the amount of UC is an input for computing Council Tax Reduction, which motivates the respective order of these benefits in the model calculations.

Next, the series of child and school related benefits are projected, the eligibility criteria of some of which depend on receipt of income support or universal credit: Sure Start Maternity Grant (41), Healthy Start (food) vouchers (42), Scotland's Best Start Grant (43), Scotland's Best Start Foods (44), the Scottish Child Payment (45) and associated bridging payments for 2021 and 2022 (46), Scottish Child Winter Heating Assistance (47), Free School Meals (48), and School Clothing Grants (49).

Finally, the benefit caps (50) are applied to benefit units projected to receive Housing Benefit (HB) or Universal Credit (UC).

Table 2.3 UKMOD Spine: Order of Simulation

	Policy	2020	2021	2022	2023	2024	2025	2026	Description of the instrument	Main output
1	SetDefault_uk	on	on	on	on	on	on	on	DEF: Default values	- - -
2	Uprate_uk	on	on	on	on	on	on	on	DEF: Uprating factors	- - -
3	ConstDef_uk	on	on	on	on	on	on	on	DEF: Constants	- - -
4	FYA_uk	switch	switch	switch	switch	switch	switch	switch	DEF: Full year adjustments to model policy variation part way through simulated year (April to March) (simulated in baseline)	- - -
5	InitVars_uk	on	on	on	on	on	on	on	DEF: Initialise variables	- - -
6	ILSDef_uk	on	on	on	on	on	on	on	DEF: Standard income concepts	- - -
7	ILSUDBDef_uk	on	on	on	on	on	on	on	DEF: Standard income concepts used to compare income concepts with UDB EU-SILC	- - -
8	IlDef_uk	on	on	on	on	on	on	on	DEF: Non-standard income concepts	- - -
9	TUDef_uk	on	on	on	on	on	on	on	DEF: Assessment units	- - -
10	BTA_uk	switch	switch	switch	switch	switch	switch	switch	DEF: Random numbers to model benefit take-up (simulated in baseline)	- - -
11	random_uk	on	on	on	on	on	on	on	DEF: Random numbers to model policy transitions	- - -
12	countries_uk	on	on	on	on	on	on	on	DEF: Keep households for respective country model. Functions within policy are switched on via extensions.	- - -
13	PAA_uk	switch	switch	switch	switch	switch	switch	switch	DEF: Pension age adjustment - changes in earnings and pensions due to increase in the State Pension age (simulated in baseline)	- - -
14	yem_uk	switch	switch	switch	switch	switch	switch	switch	DEF: Minimum wage (not simulated in baseline)	- - -
15	shocks_uk	on	on	on	on	on	on	on	DEF: Simulation of employment shocks to project CJRS and SEISS take-up	- - -
16	cjrs_uk	on	n/a	n/a	n/a	n/a	n/a	n/a	BEN: Covid-19 subsidy from the Coronavirus Job Retention Scheme (CJRS)	bwkmcee_s, yemmc_s

Table 2.3 UKMOD Spine: Order of Simulation (continued)

Policy		2020	2021	2022	2023	2024	2025	2026	Description of the instrument	Main output
17	seiss_uk	on	n/a	n/a	n/a	n/a	n/a	n/a	BEN: Covid-19 grant from the Self-employment Income Support Scheme (SEISS)	bwkmcse_s
18	tpcee_uk	on	on	on	on	on	on	on	DEF: Employee compulsory private pension contributions	- - -
19	neg_uk	on	on	on	on	on	on	on	DEF: Recode to 0 negative self-employed income	- - -
20	mif_uk	on	on	on	on	on	on	on	DEF: Calculate gross earnings for the self-employed as part of the Minimum Income Floor (MIF) policy of Universal Credit	- - -
21	lha_uk	on	on	on	on	on	on	on	DEF: Local Housing Allowance (LHA) rates	- - -
22	bmact_uk	switch	switch	switch	switch	switch	switch	switch	BEN: Statutory Maternity Pay (not simulated in the baseline)	bmact_s
23	bmanc_uk	switch	switch	switch	switch	switch	switch	switch	BEN: Maternity Allowance (not simulated in the baseline)	bmanc_s
24	bpact_uk	switch	switch	switch	switch	switch	switch	switch	BEN: Statutory Paternity Pay (not simulated in the baseline)	bpact_s
25	bdisc_uk	on	on	on	on	on	on	on	BEN: DLA reduce number of recipients (post 2011)	bdisc
26	bcrdicm_uk	on	on	on	on	on	on	on	BEN: Scottish Carer's Allowance Supplement (from Sept 2018)	bcrdicm_s
27	tscee_tscse_uk	on	on	on	on	on	on	on	SIC: Employee and self-employed national insurance contribution	tscee_s and tscse_s
28	tscer_uk	on	on	on	on	on	on	on	SIC: Employer national insurance contribution	tscer_s
29	bunct_uk	on	on	on	on	on	on	on	BEN: Contributory unemployment benefit (Jobseeker's Allowance)	bunct_s
30	boaht_uk	on	on	on	on	on	on	on	BEN: Pensioner's annual heating allowance (Winter Fuel Allowance)	boaht_s
31	bch_uk	on	on	on	on	on	on	on	BEN: Child Benefit	bch_s
32	tinta_uk	on	on	on	on	on	on	on	TAX: Personal tax allowance	tinta_s
33	tin_uk	on	on	on	on	on	on	on	TAX: Personal income tax	tin_s
34	bchrd_uk	on	on	on	on	on	on	on	BEN: Reduce child benefit (from 2013)	bchrd_s, bch_s

Table 2.3 UKMOD Spine: Order of Simulation (continued)

Policy		2020	2021	2022	2023	2024	2025	2026	Description of the instrument	Main output
35	bwkmt_bfamt_uk	on	on	on	on	on	on	on	BEN: Tax credits (Working Tax Credit and Child Tax Credit)	bwkmt_s and bfamt_s
36	bsa_uk	on	on	on	on	on	on	on	BEN: Social Assistance (income-based Jobseeker's Allowance, Income Support and Pension Credit)	bsa_s, bunmt_s, boamt_s
37	bsadi_uk	on	on	on	on	on	on	on	BEN: Social Assistance (income-based Employment and Support Allowance)	bsadi_s
38	bho_uk	on	on	on	on	on	on	on	BEN: Housing Benefit	bho_s
39	bsauc_uk	on	on	on	on	on	on	on	BEN: Universal Credit	bsauc_s
40	bmu_uk	on	on	on	on	on	on	on	BEN: Council Tax Reduction	bmu_s
41	bmamt_uk	on	on	on	on	on	on	on	BEN: Sure Start Maternity Grant	bmamt_s
42	bmamt01_uk	on	on	on	on	on	on	on	BEN: Healthy Start (food)	bmamt01_s
43	bmascmt_uk	on	on	on	on	on	on	on	BEN: Best Start Grant (Scotland)	bmascmt_s
44	bmascmt01_uk	on	on	on	on	on	on	on	BEN: Best Start Foods (Scotland)	bmascmt01_s
45	bchmt_uk	on	on	on	on	on	on	on	BEN: Child Payment (Scotland)	bchmt_s
46	bchmt01_uk	on	on	n/a	n/a	n/a	n/a	n/a	BEN: Child Payment Bridging Payments (Scotland)	bchmt01_s
47	bchht_uk	on	on	on	on	on	on	on	BEN: Child Winter Heating Assistance (Scotland)	bchht_s
48	bched01_uk	on	on	on	on	on	on	on	BEN: Free School Meals	bched01_s
49	bched02_uk	on	on	on	on	on	on	on	BEN: School Clothing Grant	bched02_s
50	bcap_uk	on	on	on	on	on	on	on	BEN: Amount of benefit cap on Housing Benefit and Universal Credit	brd_s, brduc_s
51	bhosc01_uk	on	on	on	on	on	on	on	BEN: Discretionary Housing Payments (Scotland)	bhosc01_s
52	bsaec_uk	n/a	on	on	n/a	n/a	n/a	n/a	BEN: Cost of Living Payment	bsaec_s
53	covshocks_benreceipt_uk	on	n/a	n/a	n/a	n/a	n/a	n/a	BEN: Covid-19 shocks: pre-Covid-19 receipt of benefits	- - -

2.3 Policy extensions

There are several so-called policy extensions in UKMOD.[5] More than one policy as well as functions from different policies can belong to a single extension. Furthermore, the same policy or function can belong to more than one extension. Extensions can be by default "switched on", i.e. calculations are carried out, or "off". Importantly, users can select whether to run the tax-benefit simulations with the extension being on or off via the "View / Filter / Add-Ons" tab of the model's "Run" window.

There are two benefit take-up extensions: Benefit Take-up Adjustments, **BTA**, and Benefit Take-up Adjustments Observed, **BTO**. Both these extensions are designed to reflect imperfect benefits take-up. They are distinguished by the way that take-up is prioritised among the simulated population: under BTA take-up is completely randomly allocated among eligible tax units, whereas under BTO take-up is allocated to units that are reported to receive benefits in the data first, and only then to the remainder of the eligible population. By default, BTA is switched *off* and BTO is switched *on*. Switching both BTO and BTA extensions *off* implies a full (100%) take-up. For more information on the assumed benefit take-up rates, see section 3.2.3.

There are five extensions that limit analysis to households located in selected regions: England, **ENG**, London, **LDN**, Northern Ireland, **NI**, Scotland, **SCT**, and Wales, **WLS**. These extensions are *off* by default in the UK model. However, in each country model the respective extension is *on* (e.g. SCT is *on* by default in the model for Scotland).

The Full Year Adjustment, **FYA**, extension allows for policy reforms that occur part-way through the simulated year. It is only available for simulation years where some part-year reform has been accommodated, in which case the extension is turned *on*.

The Legacy Benefits Assumption, **LBA**, is designed to simulate the case where no one receives Universal Credit, and only legacy programmes are paid. This is achieved by setting the value of the parameter *$UCtransition* to 0. This extension is turned *off* by default.

The Labour Market Adjustment, **LMA**, simulates shocks to unemployment and temporary policy measures. It was designed to reflect Covid-19 shocks, including increasing unemployment in policy years 2020-2025 and entitlements to the Coronavirus Job Retention Scheme (CJRS) and Self-Employment Income Support Scheme (SEISS) in 2020 and 2021. The extension is *on* by default. For more information, see section 0.

The Minimum Wage Adjustment, **MWA**, allows for the simulation of the Minimum Wage/National Living Wage (MW/NLW). The extension is *off* by default. If switched *on*, people's earnings are modified, so that everyone in the microdata is projected to earn an hourly wage rate at or above the MW/NLW. See section 2.4 for further details.

The Pension Age Adjustment, **PAA**, allows a choice between modelling policies that reflect increases in the State Pension age introduced from autumn 2010 (*on*) and modelling policies ignoring this change (*off*). The extension is *on* by default.

The Parental Leave Benefits, **PBE**, controls the simulation of the Maternity Allowance (policy *bmanc_uk*), Statutory Maternity Pay (*bmact_uk*) and Statutory Paternity Pay (*bpact_uk*). It is set to *off* by default from 2015 onwards.

[5] Policies or functions belonging to an extension are denoted with 'switch' in the policy spine (for a given policy year), while their default values (on or off) are set in a separate dialogue box in the model, accessible via the tab Country Tools > Set Switches in the EUROMOD User Interface (UI).

The Full Universal Credit Assumption, **UCA**, simulates the case where all individuals have transitioned from legacy benefits to the Universal Credit. This may be contrasted with the LBA extension, which assumes the opposite. This is achieved by setting the value of the parameter *$UCtransition* to 1. This extension is turned *off* by default.

All other extensions listed under the "View / Filter / Add-Ons" tab of the "Run" window are beyond the scope of this document and should be treated as experimental.

2.4 National Minimum Wage and National Living Wage

Brief description

A National Minimum Wage (NMW) was introduced in the UK in April 1999. It determines the minimum amount employees have a legal entitlement to earn per hour depending on their age. Minimum Wage is simulated as a temporary variable to validate earnings. Note that the Scottish public sector pay floor is not simulated because the variable currently used to identify civil servants in the model (*lcs*) provides insufficient detail to identify the affected population.

From April 2021 employees aged 23 and over are entitled to the National Living Wage (NLW), expanding to include individuals from age 21 from April 2024.

Eligibility conditions

The Minimum Wage covers most employees except for those exempted for various reasons. The input data for UKMOD do not permit identification of exempted employees.

Amounts

Table 2.4 reports National Minimum Wage and National Living Wage rates applicable in selected years. There are no minimum wage regulations for children of compulsory school age.

Table 2.4 National Minimum Wage and National Living Wage by Age and Year (£ per hour)

age	2020	2021	2022	2023	2024	2025	2026
16-17	4.62	4.62	4.81	5.28	5.49	5.55	5.63
18-21	6.56	6.56	6.83	7.49	7.79	7.88	8.00
22+	8.36	8.36	9.18	10.18	10.59	10.71	10.87
25+	8.91	8.91	9.50	10.42	10.84	10.96	11.12

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect earnings growth.

2.5 Social benefits

This section describes the principal social benefits included in UKMOD, listed in alphabetical order. Schemes that are included in the model but are relevant for two system years or less are described in Annex 6.5. These schemes include Cost of Living Payments (*bsaec_s*), Scottish Child Payment Bridging Payment (*bchmt01_s*), Coronavirus Job Retention Scheme (*bwkmcee_s*), and the Self-Employment Income Support Scheme (*bwkmcse_s*).

2.5.1 Benefit caps (*brd_s* and *brduc_s*)

From 15 April 2013, a "benefit cap" may limit the total amount payable to a benefit unit from selected benefits. The benefit cap is applied by reducing Housing Benefit (HB) or Universal Credit (UC). If the benefit unit is not entitled to HB (or UC), the benefit cap does not apply.

Cap liability

The benefit cap only applies if:

- the benefit unit receives HB or UC for people below the qualifying age for PC, and
- the total amount of certain 'specified benefits' received is above a certain level.

Exceptions for which the benefit cap does not apply:

- Benefit unit receives Working Tax Credit or earns more than a minimum amount (the equivalent of 16 hours of work at the National Living Wage), if receiving UC;
- Benefit unit not in receipt of Income Support, income-based Jobseeker's Allowance or income-based Employment and Support Allowance;
- People who have recently stopped working: a "grace period" of 39 weeks after stopping work is allowed to people who were formerly in work for at least 50 weeks out of the 52 weeks before the last day of work and in the 50 weeks the person in work was not entitled to Income Support, Jobseeker's Allowance or Employment and Support Allowance;
- People entitled to any of the following disability benefits: the Employment and Support Allowance (support component), Attendance Allowance, Disability Living Allowance, Personal Independence Payment, Industrial Injuries Disablement Benefit, Reduced Earnings Allowance, Retirement Allowance, or War Pension.

Specified benefits to which the cap applies

If the cap is applied through Housing Benefit, then the specified benefits included in the cap are: Income Support, Jobseeker's Allowance, Earnings and Support Allowance (if neither the claimant or his/her partner are in the support group), Housing Benefit, Bereavement Allowance, Carer's Allowance, Child Benefit, Guardian's Allowance, Child Tax Credit, Incapacity Benefit, Maternity Allowance, Severe Disability Allowance, Widowed Allowance, Widow's Pension.

Amounts

The cap applies when yearly entitlements to specified benefits exceed a threshold, defined separately for singles and couples. From 2017 different caps have applied to London and other areas (see below).

Table 2.5 Benefit Cap Rates (£ per year)

	2020	2021	2022	2023	2024	2025	2026
Greater London							
couples and single parents	23000	23000	23000	25325	25325	25325	25325
single adults	15410	15410	15410	16965	16965	16965	16965
Rest of UK							
couples and single parents	20000	20000	20000	22020	22020	22020	22020
single adults	13400	13400	13400	14755	14755	14755	14755
min earnings (£ per week)	617	617	617	617	617	617	617

Source: Rates to 2022 set by legislation. Rates from 2023 assumed frozen.

Model note: The benefit cap is not implemented as a reduction to HB or UC. The variables *brd_s* (amount of benefit cap on HB) and *brduc_s* (amount of benefit cap on UC) are subtracted from the means-tested income list (*ils_benmt*).

2.5.2 Best Start Foods (*bmascmt01_s*)

Best Start Foods (BSF) provide benefits in kind via weekly prepaid cards that can be used to purchase selected groceries.

Eligibility

Eligibility is limited to residents of Scotland (residents of the rest of the UK are eligible for Healthy Start benefits; see section 2.5.10).

Recipients must be pregnant, or responsible for a child under 3 years of age.

Eligibility is passported by receipt of the following means-tested benefits:

- Child Tax Credit
- Universal Credit
- Income Support
- Pension Credit
- Working Tax Credit
- Housing Benefit
- Jobseeker's Allowance (income-based)
- Employment and Support Allowance (income-based)

Until 2023, income limits were also imposed, that varied by the benefits received (see the *Elig* condition of the *bmascmt01_uk* policy for related detail).

Benefit amounts

The benefit amount is simulated per dependent child as outlined in Table 2.6. Similar benefits are available for pregnant women as to those with a child aged under 1, but pregnancy benefits are not included in the model due to data limitations.

Table 2.6 Best Start Foods Amounts (£ per week)

	2020	2021	2022	2023	2024	2025	2026
child aged under 1	9.00	9.00	9.00	9.90	9.90	9.90	9.90
child aged 1 to 2	4.50	4.50	4.50	4.95	4.95	4.95	4.95

Source: Rates to 2023 set by legislation. Rates from 2024 assumed frozen.

Influence on taxes and benefits

BSF vouchers are not taxable. They are not counted as income or capital for means-tested benefits or tax credits. BSF vouchers are not affected by the benefit cap.

2.5.3 Best Start Grant (*bmascmt_s*)

The Best Start Grant (BSG) is a package of three payments. It provides parents or carers who get certain benefits or tax credits with financial support during the early years of a child's life:

- the Pregnancy and Baby Payment – a one off payment to help with the costs of pregnancy or having a baby such as maternity clothes, a cot or a pram
- the Early Learning Payment – a one-off payment to help with the costs of having a pre-school child for example the costs of day trips, books or toys for home learning

- the School Age Payment – a one-off payment to help with the costs of having a child of school starting age, such as the costs of a new school bag, to pay for school trips or after school activities.

Eligibility

Eligibility is limited to residents of Scotland.

Parents can apply for the Pregnancy and Baby Payment from 24 weeks pregnant up to the day the baby is 6 months old. This goes up to 1 year old for adopted children.

Parents with children between 2 and 3 years and 6 months old are eligible for Early Learning Payment.

Parents of children starting school are eligible for School Age Payment, with benefits in each fiscal year limited to children of school admittance age in that year.

Benefit amounts

There is no income test for BSG payments, with eligibility passported with receipt of the following means-tested benefits:

- Child Tax Credit
- Universal Credit
- Income Support
- Pension Credit
- Working Tax Credit
- Jobseeker's Allowance (income-based)
- Employment and Support Allowance (income-based)

The benefit amount is outlined in Table 2.7.

Table 2.7 Best Start Grant Amounts (£ per year)

	2020	2021	2022	2023	2024	2025	2026
first pregnancy	606.00	606.00	642.35	707.25	707.25	707.25	707.25
subsequent pregnancy	303.00	303.00	321.20	353.65	353.65	353.65	353.65
early learning	252.50	252.50	267.65	294.70	294.70	294.70	294.70
school age	252.50	252.50	267.65	294.70	294.70	294.70	294.70

Source: Rates to 2023 set by legislation. Rates from 2024 assumed frozen.

Influence on taxes and benefits

BSG payments are not taxable. They are not counted as income or capital for means-tested benefits or tax credits. BSG payments are not affected by the benefit cap.

2.5.4 Child Benefit (*bch_s, bchrd_s*)

Child Benefit (CB) is a benefit paid to the person responsible for each dependent child. The amount each benefit unit receives depends on the number of dependent children in the benefit unit, subject to an income test. A child is defined as dependent if they are aged below 16, or below 19 if still in full-time education.

Eligibility

Eligibility requires the presence of dependent children in the benefit unit. The claimant does not need to be the parent of the child, it is sufficient if the claimant is responsible for the upbringing of the child.

Benefit amounts

CB is paid for all dependent children, and it is not taxable. From 2013, CB for high-income taxpayer parents became taxable, so that it is now effectively means-tested (see details below). CB is paid at two separate rates, one for the first dependent child, and another (lower) rate for all additional children. Payment rates assumed for the model are reported in Table 2.8.

Table 2.8 Child Benefit Rates (£ per week)

	2020	2021	2022	2023	2024	2025	2026
first child	21.15	21.15	21.80	24.00	25.30	25.45	25.45
each additional child	14.00	14.00	14.45	15.90	16.75	16.85	16.85

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Influence on taxes and benefits (bchrd_s)

CB is not taxable and has been ignored in the assessment of income for means-tested benefits since 2004. However, since 2013 CB has been subject to the benefit cap (see section 2.5.1). Moreover, from 2013 if the parent receiving CB or his/her partner has income over £50,000 in a tax year, this person is liable to pay tax in respect of CB (called the "high-income child benefit charge"). The income threshold has remained unchanged since 2013. The amount of tax is calculated as a percentage of the total amount of any CB paid to them or their partner. The tax payable is 1 per cent of the total amount of the CB for each complete £100 income over £50,000. The charge cannot be more than the amount of the taxable CB awarded for the year. Therefore, if income is over £60,000 in a year, the charge will equal the amount of CB awarded.

Model note: In UKMOD the reduced CB is evaluated by variable *bchrd_uk* after the income tax calculation.

2.5.5 Child Tax Credit (*bfamt_s*)

Child Tax Credit (CTC) is an income-tested refundable tax credit. In practice, CTC is calculated in common with welfare benefits as distinct from Income Tax liabilities, and its treatment in UKMOD reflects this. CTC is calculated with respect to the previous tax year's annual income.

In principle CTC is responsive to changes in income or other circumstances, which claimants are required to report. There is also an end-of-year settlement to adjust for unaccounted changes during the year, subject to an income disregard. Data limitations require UKMOD to simulate entitlements entirely on income reported during the Family Resources Survey sample period, so that it is not possible to adjust for associated income variation during the year. This is essentially equivalent to assuming that the end of year income disregard is very large.

Eligibility

CTC is an income-based tax credit paid to families with dependent children, regardless of whether the adults are in employment (*i_bfamt_Elig*). From 2009, CTC replaced all the child amounts that were previously paid under Income Support, income-based Jobseeker's Allowance and Pension Credit. CTC is comprised of a Family element and a Child element.

Assessment unit

In common with most of the UK tax and benefit system, the 'assessment unit' for CTC is the benefit unit.

Benefit amounts

The CTC and Working Tax Credit (WTC) are subject to a common means-test. The calculation of tax credits is be broken down into the following steps:

- Defining the 'relevant period'
- Defining the 'maximum amount'
- Defining the 'relevant income'
- Defining the 'threshold figure'
- Calculating the final entitlement

The 'relevant period'

This refers to the number of days the benefit unit is eligible within the tax year. For the purposes of UKMOD we assume that eligibility lasts an entire year.

The 'maximum amount'

The maximum amount of the CTC is the sum of the family element and the child element, paid for each child in the family. Children with disability are entitled to additional payments (*i_bwfmt_FamAmt*). For example, a lone parent with two children aged three and five years would qualify for the CTC family and two times the CTC child element (one for each child). Simulated rates are reported in Table 2.9.

Table 2.9 Child Tax Credit Maximum Amounts (£ per year)

	2020	2021	2022	2023	2024	2025	2026
family element	545	545	545	545	545	545	545
child element	2845	2845	2935	3235	3410	3430	3430
disability child addition	3435	3435	3545	3905	4115	4140	4140
severe disability child addition	1390	1390	1430	1575	1660	1670	1670

Source: Rates to 2023 set by legislation. Rates from 2024 frozen for family element and indexed to price (CPI) growth otherwise.

The 'relevant income'

The relevant income is simulated as the sum of annual gross income of the parent(s) including earnings, pensions (net of private pension contributions), invalid care allowance, incapacity benefit and property income (see income list *il_TC_means* for the detailed list of components). Some disregards are applied (*ydg04_s*): a weekly disregard of £100 applies to Statutory Sick Pay (*bhlwk*) and Statutory Maternity Allowance (*bmana*) received by the parent(s) and an annual disregard of £300 applies to some adult income (state and occupational pension, investment, and property income). Children's income (*ychot_s*), where applicable, is disregarded. Capital itself is not included in the means-test, although the taxable part of income from capital (*yiytx*) is considered.

The 'threshold figure'

The sum of the relevant income is compared to the 'threshold figure', which is lower when Working Tax Credits are claimed than when only CTCs are claimed. Current simulated threshold figures are reported in Table 2.10.

Calculating the final entitlement

Tax credits are withdrawn at a constant rate (see Table 2.10) against any relevant income exceeding the relevant threshold figure. In this calculation tax credit elements are tapered away in the following sequence:

- first the WTC elements, omitting the childcare tax credit element,
- next the childcare tax credit element of WTC,
- next the child and any disability elements of the CTC, and
- finally, the family element of the CTC.

Tax credits are subject to a minimum award value below which no award is made. In 2022 there was also a one-off £500 payment for working households receiving WTC[6].

Table 2.10 Tax Credit Thresholds and Withdrawal Rates (£ per annum)

	2020	2021	2022	2023	2024	2025	2026
Threshold figures							
with Working Tax Credit	6565	6565	6770	7455	7860	7905	7905
only Child Tax Credit	16480	16480	17005	18725	19740	19850	19855
withdrawal rate (%)	41	41	41	41	41	41	41

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Influence on taxes and benefits

CTC counts in full as income for HB and CTR, so needs to be simulated before these means-tested benefits. It is not taxable, so it can be simulated after income taxes.

Model note: Disability for the purposes of tax credits is assessed via a disability test assigned by a doctor and receiving a so called 'qualifying benefit'. The medical test cannot be simulated in UKMOD, nor can all the rules of qualifying benefits as some of these refer to receipt during the preceding six months. Therefore, eligibility for the disability element of the CTC has been implemented in UKMOD as receiving one of the qualifying benefits (*il_disab*>0), namely, Employment and Support Allowance (or its predecessors, Incapacity Benefit or Severe Disablement Allowance), Attendance Allowance or the care or mobility element of the Disability Living Allowance.

In addition, once CTC is in payment, this continues unchanged for the remainder of the tax year even if circumstances change. This means that some people calculated to not be entitled based on current circumstances may have been entitled at the time when they made the application.

UKMOD applies a take-up correction to CTC by default. See section 3.2.3 for more information.

2.5.6 Council Tax Reduction (*bmu_s*)

Council Tax is a local tax covering the costs of schools, social housing, and environmental costs at a local level. The amount of Council Tax depends on the size and value of the house and the number of occupiers. Council Tax is set by local authorities and the amounts thus vary

[6] Also for those receiving CTC and that were eligible for WTC but did not get it because their income was too high. This alternative is not included in the model.

considerably between areas. The structure of Council Tax Reduction (CTR) is very similar to that of Housing Benefit (HB, section 0): whereas HB subsidises rent, CTR subsidises Council Tax. In addition to CTR, there are several other reductions to Council Tax that are not simulated by the model. These include exemptions for people affected by impairment or disability, as well as a reduction of 25% if the dwelling is occupied by a single adult. The model's input data reports Council Tax net of these 'other reductions'.

There are two alternative forms of CTR. One is based on the council tax liability, needs and resources of a benefit unit. The other is the Second Adult Rebate (SAR). Only the higher of the two benefits is paid. The SAR is not subject to capital limits and is payable when there is more than one adult in the household, but only one non-exempt adult. SAR is omitted from the model simulations.

Benefit amounts

CTR is calculated in the same way as HB except that the taper rate on income above the relevant 'applicable amount' is 20% rather than 65%, and non-dependent deductions are as reported in Table 2.11.

Table 2.11 Non-dependent Deductions for Council Tax Reduction by Income Threshold and Region (£ per week)

	2020	2021	2022	2023	2024	2025	2026
Scotland							
deduction	4.30	4.30	4.45	4.90	5.15	5.20	5.20
upper income threshold	213.00	213.00	228.00	251.05	264.60	266.10	266.15
deduction	8.50	8.50	8.80	9.70	10.20	10.25	10.25
upper income threshold	370.00	370.00	396.00	436.00	459.60	462.20	462.30
deduction	10.80	10.80	11.15	12.30	12.95	13.00	13.00
upper income threshold	458.00	458.00	490.00	539.50	568.70	571.90	572.00
deduction	12.90	12.90	13.30	14.65	15.45	15.50	15.50
upper income threshold	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rest of UK							
deduction	4.00	4.00	4.10	4.55	4.80	4.80	4.80
upper income threshold	207.70	207.70	214.15	235.75	248.55	249.95	250.00
deduction	8.10	8.10	8.35	9.20	9.70	9.75	9.75
upper income threshold	360.10	360.10	371.25	408.75	430.90	433.35	433.40
deduction	10.20	10.20	10.50	11.60	12.20	12.30	12.30
upper income threshold	447.40	447.40	461.25	507.85	535.35	538.40	538.50
deduction	12.20	12.20	12.60	13.85	14.60	14.70	14.70
upper income threshold	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: Rates to 2021 set by legislation. Rates from 2022 indexed to reflect price (CPI) growth.

Model note: The parameters for Income Support, HB and CTR are independently specified. When making policy changes, the user should consider whether the three sets of parameters should be kept consistent with one another. UKMOD applies a take-up correction to CTR by default. If a family receives income-based Employment Support Allowance, Income Support, Pension Credit or Universal Credit, then CTR is assumed to be taken-up. If a family does not receive any of these benefits, CTR is subject to a take-up rate lower than 100% depending on tenure type. See section 3.2.3 for more information.

Influence on taxes and benefits

CTR is not taxable. CTR is not counted as income or capital for means-tested benefits or tax credits. CTR is not affected by the benefit cap.

2.5.7 Discretionary Housing Payment (*bhosc01_s*)

Eligibility

DHP can be obtained by residents in Scotland who are in receipt of either Housing Benefit or Universal Credit that includes an element to meet housing costs.

Benefit amounts

DHPs are administered by local authorities, and they must decide on what basis they award DHPs and how much they will pay. However, DHPs are designed to fully mitigate the Housing Benefit bedroom tax (see section 0). DHPs in UKMOD are designed only to off-set the Housing Benefit bedroom tax for Scottish residents.

Influence on taxes and benefits

DHPs are not taxable, are not counted as income for means-tested benefits or tax credits, and are not subject to the benefits cap.

2.5.8 Employment and Support Allowance, income-based (*bsadi_s*)

Employment and Support Allowance (ESA) was introduced on 27 October 2008. It is a benefit for people who have "limited capability for work" and who are not entitled to Statutory Sick Pay. ESA replaces Incapacity Benefit and Income Support on "grounds of disability" for new claimants.

There are two types of ESA. Contributions-based ESA (c-ESA – *bdict02*) is non-means-tested and paid if the recipient satisfies National Insurance contribution conditions. Income-based ESA (ib-ESA – *bsadi_s*) is paid if National Insurance conditions are not made, subject to a means test. It is possible to receive c-ESA topped up with ib-ESA. Only ib-ESA is simulated by UKMOD, with c-ESA derived from the input data.

ESA is evaluated in two phases. During the "assessment phase", the individual gets a basic allowance that depends on a personal applicable amount (see below) and their income. In the "main phase" of ESA one of two additional components is added to the basic allowance depending on the level of disability. The "support component" is payable to individuals assessed to have "limited capability for work-related activity", and the "work-related activity component" is payable to individuals assessed as being in the "work-related activity group" (WRAG). The WRAG requires individuals to participate in work-focused interviews and possibly undertake some work-related activity.

Eligibility

The main eligibility rules to qualify for ib-ESA are:

- having limited capability for work because of mental or physical conditions, which is determined as part of a work capability assessment;
- having benefit unit income lower than the applicable amount;
- having capital less than an upper threshold;

- being aged 16 or over and under pension age, not in education, not entitled to Pension Credit, Statutory Sick Pay, Income Support, or Jobseeker's Allowance, and not in a couple entitled to joint-claim Jobseeker's Allowance or Income Support;
- not engaged in full-time work;
- if a partner is present, the partner should also not be working full-time, and not be in receipt of ib-ESA, income-based Jobseeker's Allowance or Pension Credit in his/her own right.

Benefit amounts

The calculation of ib-ESA is based on the 'applicable amount' and the income of the claimant and their benefit unit.

The applicable amount is calculated by adding together:

- personal allowances (which are the same as for Income Support);
- premia (only the enhanced disability, severe disability, carer, and pensioner premia apply);
- in the main phase, either the support component[7] or the work-related activity component[8];
- disregards;
- certain housing costs if the claimant is responsible for them.

The components of the ib-ESA applicable amount that are distinct from Income Support are reported in Table 2.12; see section 2.5.12 for Income Support.

Table 2.12 Income-based Employment and Support Allowance Premia (£ per week)

	2020	2021	2022	2023	2024	2025	2026
work related activity	29.7	29.7	30.6	33.7	35.5	35.7	35.75
support component	39.4	39.4	40.6	44.7	47.1	47.4	47.4

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Income and non-dependent deductions are calculated in the same way as for Income Support and these are subtracted from the applicable amount; see section 2.5.12 for details.

Model note: Many of the parameters related to ib-ESA are the same as those for Income Support and in UKMOD they are used with the same name. This means that the ib-ESA parameters cannot be changed separately from those of Income Support. When making policy changes, the user should consider whether this is what they intend. If not, then they should add new variables to accommodate variation of interest.

In practice ESA was introduced gradually from October 2008 and it was fully in place from 2014. It initially applied only to new claimants, while existent claimants continued to receive Incapacity

[7] The support component is one of the additional components that can be included as part of ESA. It is payable only after the assessment phase has ended and if somebody is assessed as having "limited capability for work-related activity".

[8] The work-related activity (WRA) component can be included as part of ESA when somebody is regarded as being in the "work-related activity group" (WRAG) which means that he/she is required to take part in work-focused interviews and possibly undertake some work-related activity. Claimants can be entitled to the WRA component if the assessment phase has ended, they are not assessed as having limited capability for work-related activity (i.e. they are not entitled to the support component), they comply with the requirement to attend work-focused interviews and associated activities. From April 2017 new ESA claimants in the work-related activity group (WRAG) receive per week the same amount as Jobseeker's Allowance claimants (£73.1 per week), in practice abolishing the WRAG component of ESA (which will reduce from £29.05 per week to zero) and the equivalent element of UC. This change will not create immediate losses of benefit income in our base year (2017/18), because only new recipients are affected. Ultimately though, all claims will be assessed under the new, less generous rules in the future.

Benefit and/or Income Support. During the transition period nobody was supposed to lose from the change to ESA. UKMOD reflects this by first computing Income Support / income-based Jobseeker's Allowance, including entitlement based on disability during the transition period. The model then computes ib-ESA. Eligibility to ib-ESA is defined in the model based on whether a person has limited capability to work (has experienced any disability period *ddipd*>0 or is entitled to any component of Disability Living Allowance), he/she is of working age and not in full-time education or full-time work, and whether their benefit unit's capital is less than £16,000; if there is a partner UKMOD checks also for his/her total hours of work being lower than 24 per week. UKMOD then assumes that, when somebody is entitled to both Income Support and ib-ESA, they receive the higher amount so that no losses are introduced due to implementation assumptions.

UKMOD applies a take-up correction to ib-ESA by default. The take-up rate is assumed to be the same as for Income Support. See section 3.2.3 for more information.

Influence on taxes and benefits

Income Support, Jobseeker's Allowance, and Working Tax Credit are counted as income for ib-ESA purposes, and so these benefits need to be simulated before ib-ESA. Because of non-dependent deductions and the fact that receipt of either Income Support, income-based Jobseeker's Allowance or ib-ESA acts as a passport to maximum HB and CTR, these benefits are simulated before both HB and CTR. ib-ESA is not taxable.

2.5.9 Free School Meals (*bched01_s*)

Free School Meals (FSM) provide meals for children while they attend school (in-kind benefits) and are included in UKMOD from 2017.

Eligibility

From 2017, "infant free school meals" have been provided to all children in English and Scottish government-funded schools attending reception class, or years 1 or 2. In Scotland, this was extended to years 3 to 5 in 2022, and to all primary school children (years 1 to 6) from 2026.

Other dependent children in government-funded non-tertiary schools throughout the UK may also receive FSM, if their respective benefit units are in receipt of:

- Income Support
- Jobseeker's Allowance (income-based)
- Employment and Support Allowance (income-based)
- Pension Credit (guarantee credit)
- Child Tax Credit
- Universal Credit

Beyond receipt of the above listed benefits, certain other conditions apply. In England and Wales, if Child Tax Credit is received, then there should be no entitlement to Working Tax Credit, and gross income is subject to an upper limit. In Scotland, Working Tax Credit can be received in addition to Child Tax Credit, but subject to a lower ceiling on gross income. In Northern Ireland, either Child Tax Credit or Working Tax Credit can be received, subject to the same limit on gross income. From 2019, if Universal Credit is received, then household income is also subject to an upper limit throughout the UK. The list of passport benefits considered in Scotland omits the Pension Credit. Income thresholds by region assumed by the model are reported in Table 2.13.

Table 2.13 Free School Meals Rates and Thresholds

	2020	2021	2022	2023	2024	2025	2026

Rates (£ per month)							
primary students	84.78	84.78	87.04	94.92	98.85	99.45	99.43
secondary students	79.19	79.19	81.3	88.66	92.33	92.89	92.87
Thresholds (£ per year)							
with tax credits, England, Wales, and Northern Ireland	16190	16190	16190	16190	16190	16190	16190
with Child Tax Credit only, Scotland	16480	16480	17005	18545	19310	19430	19425
with Child and Working Tax Credits, Scotland	7500	7500	7920	8635	8995	9050	9045
with Universal Credit, England Wales, and Northern Ireland	7400	7400	7400	7400	7400	7400	7400
with Universal Credit, Scotland	7500	7500	7920	8640	9000	9060	9060

Source: Rates to 2020 set by legislation. Rates from 2021 indexed to reflect price (CPI) growth, except thresholds in England, Wales, and Northern Ireland.

Benefit amounts

The value of benefits received in the form of FSM is assumed to vary between primary and secondary school students as reported in Table 2.13. These values are based on financial statistics reported for local government in Scotland.

Influence on taxes and benefits

Benefits provided in the form of FSM are not taxable, not counted as income or capital for means-tested benefits or tax credits, and are not affected by the benefit cap.

2.5.10 Healthy Start (food, *bmamt01_s*)

The Healthy Start (food, HSF) program provides benefits in kind via vouchers that can be used to purchase selected groceries.

Eligibility

Since August 2019, HSF has been replaced for residents of Scotland by the Best Start Foods program (see section 2.5.2).

Recipients must be pregnant, or responsible for a child under 4 years of age.

Eligibility is passported by receipt of the following means-tested benefits:

- Income Support
- Jobseeker's Allowance (income-based)
- Employment and Support Allowance (income-based)
- Child Tax Credit
- Pension Credit
- Universal Credit

Families in receipt of the Child Tax Credit should not be eligible to the Working Tax Credit and are also subject to an upper threshold on gross income. Furthermore, families in receipt of Universal Credit are also subject to an upper income limit. These income thresholds are reported in Table 2.14.

Benefit amounts

The benefit amount is simulated per dependent child as outlined in Table 2.14. Similar benefits are available for pregnant women as to those with a child aged under 1, but pregnancy benefits are not included in the model due to data limitations.

Table 2.14 Healthy Start (food) Rates and Thresholds

	2020	2021	2022	2023	2024	2025	2026
Rates (£ per week)							
child aged under 1	8.5	8.5	8.5	8.5	8.5	8.5	8.5
child aged 1 to 3	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Thresholds (£ per year)							
Child Tax Credit receipt	16190	16190	16190	16190	16190	16190	16190
Universal Credit receipt	4896	4896	4896	4896	4896	4896	4896

Source: Rates to 2022 set by legislation. Rates from 2023 assumed frozen.

Influence on taxes and benefits

HSF vouchers are not taxable. They are not counted as income or capital for means-tested benefits or tax credits. HSF vouchers are not affected by the benefit cap.

2.5.11 Housing Benefit (*bho_s*)

Housing Benefit (HB) subsidises housing rental costs for low-income families who are public-sector tenants, and Local Housing Allowance (LHA) does the same for private-sector tenants.

Model note: UKMOD simulates HB and LHA jointly, as the two schemes are closely related.

There are no conditions regarding working hours: the benefits cover those in work, pensioners, the unemployed, the disabled and the inactive. Several aspects governing payment of HB and LHA are common to Income Support and income-based Jobseeker's Allowance, including the personal allowances, premiums, and the inclusion of non-dependents in benefit calculations.

From April 2008, the LHA is designed to limit the contribution towards the cost of rent for private-sector tenants. This is achieved by:

- limiting the amount of the benefit to a certain percentile point of local market rents for similar tenancies in a Broad Rental Market Area (BRMA), and
- introducing a maximum level to the benefit for private tenants at the UK level by category of dwelling.

Eligibility

The main eligibility rules for HB and LHA are having low income and being responsible for paying rent (and other housing costs). HB and LHA are not payable if the property is owned by the partner of the claimant or is Crown property.

Model note: It is assumed that the person in the household identified in the FRS data as responsible for housing costs (*dhr*) pays the rent and claims the benefit.

Benefit amounts

The calculations of HB and LHA are based on the 'applicable amount', the 'maximum HB/LHA' and the income of the claimant and their benefit unit.

Applicable amount (*i_bho_prelimAmt*)

In common with other means-tested benefits, the 'applicable amount' consists of personal allowances and premia. The rates for personal allowances (*i_bho_PersAllow*) and premia are predominantly the same as for Income Support (IS) for claimants under 60 (see section 2.5.12). Exceptions are shown in Table 2.15.

Table 2.15 Housing Benefit Allowances and Premia (£ per week)

	2020	2021	2022	2023	2024	2025	2026
Allowances							
single pensioner 60-64	177.10	177.10	182.60	201.05	211.95	213.15	213.15
single pensioner 65+	191.15	191.15	197.10	217.00	228.75	230.05	230.10
couple both 60-64	270.30	270.30	278.70	306.85	323.45	325.30	325.35
couple, at least one 65+	286.05	286.05	294.90	324.70	342.25	344.20	344.30
children	68.60	68.60	70.80	77.78	81.99	82.46	82.47
Premia							
family	17.65	17.65	17.85	18.55	19.55	19.65	19.65
disability - child	65.94	65.94	68.04	74.69	78.73	79.18	79.19
enhanced disability - child	26.67	26.67	27.44	30.17	31.8	31.98	31.99

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Maximum HB/LHA

The 'maximum Housing Benefit' consists of 'eligible rent' minus deductions for non-dependents and empty bedrooms (the bedroom tax). 'Eligible rent' is the amount of rent paid, subject to limits specified by the respective local authorities.

Model note: UKMOD does not currently include any local specifications for Housing Benefit for social tenants. Therefore, the amount of rent paid that is reported in the data is taken as 'eligible rent' for HB calculations.

From April 2008 HB for social tenants was distinguished from LHA payable to private tenants. In 2009 LHA could include actual rent plus £15 per week if this was lower than the *median* (50^{th} percentile) of local reference rent for accommodations with a similar number of bedrooms (up to five). The local reference rent is calculated for each Broad Rental Market Area (BRMA).

From 2011, for new claimants:

- the dwelling categories were restricted to five: 1 bedroom shared accommodation, 1 bedroom self-contained accommodation, 2 bedroom, 3 bedroom, and 4 or more bedroom dwellings;
- the local reference rent was lowered and set at the *30^{th} percentile* of local rents within each BRMA, and;
- the LHA for each category of dwelling was also capped at a national level maximum distinguished by number of bedrooms.

From 2012, for all claimants:

- the £15 per week addition was removed;
- the local reference rent categories were restricted to four (the 5+ and bedroom categories were amalgamated) plus the LHA for 1 bedroom shared accommodation.

From 2013, eligible rent is reduced by 14% for one bedroom exceeding the eligible rooms for a benefit unit, and 25% for more than one bedroom exceeding the eligible limit (the bedroom tax).

Non-dependent deductions are the same as those operating in Income Support (IS) for housing needs (see above).

LHA rates in the simulations

Since 2011, simulated LHA comprises a set of rates for the following accommodation types: 1 bedroom shared accommodation; 1 bedroom self-contained dwellings; 2 bedroom dwellings; 3 bedroom dwellings, and 4 bedroom dwellings. LHA rates for each household are calculated as follows:

Calculating the number of eligible rooms in the input micro-data (*bhoro*)*:* The UKMOD input micro-data include the derived household-level variable *bhoro* for the number of eligible rooms under LHA. The variable definition varies by the number, age and sex (if applicable) of dependent children, and the number of adults in the household.

Defining the average regional LHA rates by accommodation type in the model: LHA rates used in UKMOD are based on average rates for the 12 UK regions. Although rates vary by BRMA, the public release End User License version of the FRS reports only region of residence. Thus, we map regions to a Local Authority District (LAD)-BRMA table[9] and compute averages by region. LHA rates are defined as *constants* in the model in policy *lha_uk* with the following constant names: *$LHAShAcc* (for 1-bedroom shared accommodation), *$LHA1bed* (1-bedroom self-contained dwellings), *$LHA2bed* (2 bedroom dwellings), *$LHA3bed* (3 bedroom dwellings) and *$LHA4bed* (4 bedroom dwellings). *Condition* parameters are used to set the rates by region.

Given the above information, the model calculates the applicable LHA rate for each household (*i_lha30*).[10]

Income of the claimant

The definition of income against which HB/LHA is assessed is as defined for Income Support (section 2.5.12), but also includes benefits provided by the Working Tax Credit (except the 30 hours element) and the Child Tax Credit. The earnings disregard (*ydg03_s*) for HB/LHA is also the same as for Income Support, except if any of the following conditions are met:

- the claimant or partner receive the 30 hours element in Working Tax Credit;
- the claimant or partner are aged 25 or over and work 30+ hours per week;
- the claimant or partner work 16 hours or more per week and the claim includes the family premium;
- the claimant or the partner are working 16 hours or more per week and the claim includes the disability or higher pensioner premium.

If any of the above conditions are met, then the earnings disregards (*i_bho_EligEarnsDisregard*) are increased by a "full-time" top-up. An earnings disregard is also simulated for lone parents.

There is also an additional disregard for childcare costs, designed so that those receiving the childcare element of WTC do not lose any of the payment through the HB means-test. An allowance for childcare costs (*i_bho_EligChildCareDisregard2*) can be deducted from earnings if the claimant is a lone parent and working 16 hours or more per week, or if a couple are claiming

[9] We thank Alex F. Fenton, Research Fellow at the Centre for Analysis of Social Exclusion London School of Economics, for previously making this table available to us.

[10] In previous versions of UKMOD, the LHA rates were hard-coded in the model's input data. Defining them as model parameters facilitates associated sensitivity analysis.

who are either both working 16 hours or more or one is working 16 hours or more and the other is 'incapacitated', i.e. unable to work and in receipt of income replacement disability benefits (such as Incapacity Benefit, Employment and Support Allowance or the disability element of IS).

Tariff income for working-age people is treated as defined for Income Support (section 2.5.12). Tariff income for people above State Pension age is treated as defined for Pension Credit (section 2.5.17).

For families in receipt of Income Support or Pension Credit Guarantee Credit or income-based Employment and Support Allowance, HB covers 100% of "eligible rent" (see below), minus non-dependent deductions. Non-dependent deductions work in the same way as for Income Support (and income-based Jobseeker's Allowance) and Pension Credit (see below).

For those with higher incomes (or not in receipt of Income Support), the amount of eligible rent (less non-dependent deductions) that is covered by the benefit is 100% if the 'applicable amount' is larger than the income. Where the 'applicable amount' is less than income, then the 'maximum Housing Benefit' is tapered away at the rate of 65%.

Model note: While many of the parameters related to HB/LHA are the same as those for Income Support (and Council Tax Reduction – see section 2.5.6) in UKMOD they are specified separately so that they can be varied if this is desired. Design of policy counterfactuals concerning these model parameters should also consider whether the associated parameters for Income Support should also be adjusted.

UKMOD applies a take-up correction to HB/LHA by default. See section 3.2.3 for more information.

Influence on taxes and benefits

Housing Benefit is simulated after tax credits, Pension Credit, Income Support and income-based Employment Support Allowance, as the non-dependent deductions and means calculations depend upon these other benefits. HB/LHA is not taxable.

2.5.12 Income Support (*bsa_s*)

Income Support (IS) is a safety net payment for people of working age who are not expected to seek work, while income-based Jobseeker's Allowance (ib-JSA) is the safety net benefit for people who are able to work. An individual may not receive both contributions-based Jobseeker's Allowance and either IS or ib-JSA, although a partner can receive contributions-based Jobseeker's Allowance at the same time that a claimant receives IS or ib-JSA. The unit of entitlement and income assessment for IS and ib-JSA is the benefit unit. IS on grounds of disability was gradually replaced by income-based Employment Support Allowance (section 2.5.8) from 27 October 2008, which is reflected in UKMOD from 2009.

Eligibility

IS and ib-JSA are largely based on the same eligibility criteria and are subject to the same rules governing the value of the benefits payable. The two benefits are distinguished by their respective labour market requirements: ib-JSA is payable to people who are actively looking for work, whereas IS is payable to people who have no work requirement, including carers, lone parents[11], and people on unpaid parental leave. Additional conditions for both benefits are that claimants

[11] If you are under 18, you can claim IS if you are a lone parent, whatever the age of your child(ren). The age limit for a child was 16 before 24 November 2008, 12 before 26 October 2009, 10 before 25 October 2010, 7 before 21 May 2012, and 5 from April 2013.

work less than 16 hours per week, are not full-time students, are under the current State Pension age and do not have savings above an upper threshold.

Model note: In UKMOD, ib-JSA and IS are implemented together as the rules are largely the same. Throughout the remainder of this section IS is used to refer jointly to IS and ib-JSA unless otherwise stated.

Benefit amounts

The award is calculated by adding together the personal allowances, premia and disregards (plus housing costs if applicable) and then subtracting any income and non-dependent deductions.

Model note: IS and ib-JSA are treated equivalently up to the point where the benefit is evaluated. In a final step, IS (*bsa_s*) and ib-JSA (*bunmt_s*) are distinguished according to their respective eligibility criteria.

Applicable amount

The applicable amount for IS is the sum of personal allowances, premiums and housing costs. Each claimant has a single allowance which vary by age. In contrast, multiple premia may apply to a single claimant, and premia are independent of age. Table 2.16 reports allowances and premia assumed for IS by UKMOD (*i_bsa_PersAllow, i_bsa_EligDisPremium*, *i_bsa_DisPremium*, *i_bsa_EligPensPremium1*).

Table 2.16 Income Support and Income-based Jobseeker's Allowance Allowances and Premia (£ per week)

	2020	2021	2022	2023	2024	2025	2026
Allowances							
single 18-24	59.20	59.20	61.05	67.20	70.85	71.25	71.25
single 25+	74.70	74.70	77.00	84.80	89.40	89.90	89.90
lone parent 16-17	59.20	59.20	61.05	67.20	70.85	71.25	71.25
lone parent 18+	74.70	74.70	77.00	84.80	89.40	89.90	89.90
couple one under 18	89.45	89.45	92.20	101.50	107.00	107.60	107.60
couple both over 18	117.40	117.40	121.05	133.30	140.50	141.30	141.35
Premia							
carer - one adult qualifies	37.70	37.70	38.85	42.75	45.05	45.30	45.35
carer - two adults qualify	37.70	37.70	38.85	42.75	45.05	45.30	45.35
disability - single	35.10	35.10	36.20	39.85	42.00	42.25	42.25
disability - couple	50.05	50.05	51.60	56.80	59.85	60.20	60.20
enhanced disability - single	17.20	17.20	17.75	19.55	20.60	20.75	20.75
enhanced disability - couple	24.60	24.60	25.35	27.90	29.40	29.60	29.60
severe disability - single	67.30	67.30	69.40	76.40	80.55	81.00	81.00
severe disability - couple	134.60	134.60	138.80	152.80	161.05	162.00	162.00

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Disability is defined according to receipt of certain disability benefits, called 'qualifying benefits'. Qualifying benefits must be received within the last six months of claiming IS. This 'linking rule' was introduced to encourage people with disabilities to move into work without the risk of losing disability premia if they subsequently leave work.

Qualifying benefits for the disability premium (*i_bsa_EligDisPremium*) are: Disability Living Allowance (either the mobility component *bdimb* or the care component *bdisc*), Severe Disablement Allowance (*bdisv*) or long-term Incapacity Benefit (*bdict01*) or its replacement

Employment and Support Allowance (*bdict02*) and the disability element of the Working Tax Credit. Working Tax Credit would not be received at the same time as IS and is consequently not included in the simulation.

Qualifying benefits for the enhanced disability premium (*i_bsa_DisPremium*) are: Disability Living Allowance care component received at the highest rate.

Qualifying benefits for the severe disability premium (*i_bsa_SevDisPremium*) are: Attendance Allowance, and the middle or higher rate care component of Disability Living Allowance (*bdisc*). Furthermore, the claimant should receive care from someone who receives the Carer's Allowance (*bcrdi*) and there should be no non-dependents living in the household. Additional rules apply to claimants who are registered blind, although data limitations prevent these from being applied.

Qualifying benefit for the carer premium (*i_bsa_CarerPremium*) is the Carer's Allowance (*bcrdi*).

Housing costs

Housing costs not covered by Housing Benefit can be included in IS (*i_bsa_DeductHousCosts2*). Providing that the claimant is responsible for the housing costs (*i_bsa_RespHousCosts*), mortgage interest payments (*xhcmomi*) may be included in the calculation of the applicable amount and offset by non-dependent deduction (*i_bsa_DeductHousCosts1*). The upper limit up of mortgage loans for which interest payments are covered is £100,000 (or £200,000 in some circumstances). There are variable waiting times (between 16 and 39 weeks) after qualifying for benefit before mortgage interest is included in the calculation of the applicable amount.

Model note: UKMOD does not account for the upper limit on mortgage loans nor the associated waiting period. Some other housing costs (such as ground rent or service charges for the upkeep of communal areas in shared buildings) are in principle also covered by IS but because our data do not distinguish these from other charges UKMOD does not take them into consideration.

Income assessment

One claim for IS is made per benefit unit and the entitlement depends on the income of all benefit unit members (*il_IS_means*). The measure of income includes most income sources, omitting investment income and selected benefits (Housing Benefit and Council Tax Reduction, Attendance Allowance and Disability Living Allowance). Investment income is proxied by a capital tariff worth £1 per week for every £250 of capital above a capital disregard, and eligibility is limited to benefit units with aggregate capital below an upper threshold. Furthermore, half of the value of private pension contributions and all of employee and self-employed contributions and income tax are deducted.

Some earnings and other income are disregarded (*ydg01_s*), where the disregards vary with benefit unit characteristics. Further disregards apply to war pensions and maintenance payments. Income from investment income is not included directly in the IS family income assessment. Earnings disregards and capital limits are shown in Table 2.17.

Table 2.17 Earnings Disregards and Capital Limits: Income Support and Income-based Jobseeker's Allowance

	2020	2021	2022	2023	2024	2025	2026
Earnings disregards (£ per week)							
single	5.00	5.00	5.00	5.00	5.00	5.00	5.00
couple	10.00	10.00	10.00	10.00	10.00	10.00	10.00
lone parent*	20.00	20.00	20.00	20.00	20.00	20.00	20.00
disability	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Capital limits (£)							
disregard	6000	6000	6000	6000	6000	6000	6000
upper limit	16000	16000	16000	16000	16000	16000	16000

*Source: Rates to 2023 set by legislation. Rates from 2024 assumed frozen. Note: * Lone parents on Housing Benefit or Council Tax Rebate have £25 of their earnings ignored.*

<u>Multiple benefit unit households</u>

In households with multiple benefit units, the housing cost element of the IS applicable amount (*i_bsa_EligHousCosts*) is allocated to the benefit unit of the "householder". The "householder" is the person responsible for the rent or mortgage interest (*i_bsa_RespHousCosts*) and he/she is identified in the UK data (*dhr*). Furthermore, the housing cost element of IS is reduced in households comprised of multiple benefit units by "non-dependent deductions" that apply in respect of adult household members who live in benefit units other than that of the householder.

Generally, a single deduction applies for each adult not in the householder's benefit unit who works at least 16 hours per week (*lhw*), is at least 18 years of age, or 25 years of age if in receipt of IS. Furthermore, deductions vary with the adult's weekly gross income (*il_ISPC_nondep_means*). Modelled deductions are reported in Table 2.18.

Other variations to non-dependent deductions apply in practice but are not included in UKMOD. These include whether a non-dependent adult is in full time education, blind, or in receipt of Attendance Allowance (*bdioa*), or the middle or higher rate of the care component of Disability Allowance (*bdimb*).

Table 2.18 Non-dependent Deductions: Income Support and Income-based Jobseeker's Allowance (£ per week)

	2020	2021	2022	2023	2024	2025	2026
deduction*	15.95	15.95	16.45	18.10	19.10	19.20	19.20
upper income threshold	149.00	149.00	154.00	162.00	171.00	172.00	172.00
deduction	36.65	36.65	37.80	41.60	43.85	44.10	44.10
upper income threshold	217.00	217.00	224.00	236.00	249.00	250.00	250.00
deduction	50.30	50.30	51.85	57.10	60.20	60.55	60.55
upper income threshold	283.00	283.00	292.00	308.00	325.00	327.00	327.00
deduction	82.30	82.30	84.85	93.40	98.45	99.00	99.05
upper income threshold	377.00	377.00	389.00	410.00	432.00	435.00	435.00
deduction	93.70	93.70	96.60	106.35	112.10	112.75	112.75
upper income threshold	469.00	469.00	484.00	511.00	539.00	542.00	542.00
deduction	102.85	102.85	106.05	116.75	123.05	123.75	123.80
upper income threshold	n/a	n/a	n/a	n/a	n/a	n/a	n/a

*Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth. Notes: * An additional condition is that the non-dependent is working fewer than 16 hours per week.*

Influence on taxes and benefits

Working Tax Credit and contributions-based Jobseeker's Allowance count as income for IS, and so these benefits are evaluated before IS by UKMOD. In contrast, as IS acts as a passport to maximum Housing Benefit and Council Tax Reduction, these benefits are evaluated after IS. IS is not taxable, while ib-JSA is. The tax on ib-JSA is not deducted at source, but instead reduces the refund received on return to work. UKMOD consequently omits ib-JSA from the taxable base.

UKMOD applies a take-up correction to IS and ib-JSA by default. See section 3.2.3 for more information.

2.5.13 Jobseeker's Allowance, contributions-based (*bunct_s*)

Contributions-based Jobseeker's Allowance (c-JSA) is a flat-rate contributory benefit for the unemployed. The basic amount paid depends on the individual's age alone, with lower payments going to younger workers. There are no dependents' additions. There is no association with past earnings other than the contributions condition. c-JSA is payable for up to six months.

The unit of assessment is the individual (*tu_individual_uk*).

Eligibility

There are four main eligibility conditions for c-JSA. The claimant must:

- be under State Pension age;
- be available for (and show proof of actively seeking);
- have paid or been credited with sufficient National Insurance contributions in the two tax years before the year of claim;
- not be in full-time paid work (from 2011 people working 16 or more hours per week are considered in full-time work).

Benefit amounts

Although c-JSA is not means-tested, it is counted as income for other means-tested benefits. In effect, this means that c-JSA is withdrawn at the rate of 100% for any earnings (*yem* + *yse*) more than an earnings disregard, and any private (personal or occupational) pension (*ypp* + *boactcm*) in excess of a private pension disregard. These disregards are reported in Table 2.19.

Table 2.19 reports payment rates by age band for selected policy years.

Table 2.19 Rates and Disregards: Contributions-based Jobseeker's Allowance (£ per week)

	2020	2021	2022	2023	2024	2025	2026
Rates							
aged 18-24	59.20	59.20	61.05	67.20	70.85	71.25	71.25
aged 25+	74.70	74.70	77.00	84.80	89.40	89.90	89.90
Disregards							
private pensions	50.00	50.00	50.00	50.00	50.00	50.00	50.00
earnings	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Source: Rates to 2021 set by legislation. Rates from 2022 indexed to reflect price (CPI) growth for benefit rates and are frozen for disregards.

Influence on taxes and benefits

c-JSA is taxable and counts as income for means-tested benefits, so it needs to be simulated before income tax and means-tested benefits.

Model note: The FRS data do not contain the sufficient information to establish contribution records for reported individuals. Two methods have been implemented to address the information gap. First, the default specification of the model simulates eligibility based on benefit receipt reported by the data (*bunct*>0), so long as other eligibility conditions are satisfied. For those currently in receipt of c-JSA, the contribution period (*liwmy_s*) is imputed to match at least the two years required for eligibility, while for those currently unemployed and not in receipt, it is assumed to be zero. To capture the monthly benefits reported by the data, it is assumed that unemployment benefits are received for the whole year by default, or six months via optional selection.

Alternatively, it is possible to fully simulate eligibility in UKMOD. This option is switched off by default. The FRS data only report whether an individual has worked for two years at some point (*liwwh*) whereas c-JSA requires the individual to have worked in the last two years. Using the available information to proxy the employment requirement consequently over-states eligibility for c-JSA in practice.

2.5.14 Jobseeker's Allowance, income-based (*bsa_s*)

Income-based Jobseeker's Allowance is modelled jointly with Income Support in UKMOD; see section 2.5.12 for further details.

2.5.15 Local Housing Allowance (*bho_s*)

The Local Housing Allowance is modelled jointly with Housing Benefit in UKMOD; see section 2.5.11 for further details.

2.5.16 Maternity Allowance (*bmana, bmanc_s*)

Maternity Allowance (MA) is intended to help women who are not eligible for Statutory Maternity Pay to take time off work both before and after their child's birth.

Eligibility

MA is payable to pregnant women or new mothers who are not eligible for Statutory Maternity Pay (see section 2.5.22).

The benefit is payable for 39 weeks to women who, in the 66 weeks before their baby is due, were:

- employed for at least 26 weeks; or
- self-employed and paid National Insurance contributions (Class 2) for at least 26 weeks; and
- earned (or classed as earning) a minimum sum in at least 13 weeks.

The requirements described above do not need to be consecutive or in the same employment. If the above requirements are not met, then the benefit can be paid for the shorter term of 14 weeks, where a woman, in the 66 weeks before the baby is born:

- provided unpaid work for the business of their spouse or partner, and
- was not employed or self-employed during the same period, and
- their spouse or partner was registered as self-employed, and
- their spouse or partner paid Class 2 National Insurance contributions.

Benefit amounts

The benefit normally starts at the beginning of the 11th week before the expected date of birth of the child. The latest date it can start is the day after the birth.

For women who qualify for MA due to their work as employees, the benefit pays 90% of the individual's average weekly earnings or a fixed weekly rate, whichever is lower.

For women who qualify for MA due to self-employment, the benefit pays a sliding scale between a maximum and minimum rate, depending on the term that they were registered as self-employed with HM Revenue and Customs, and the number of weeks of National Insurance contributions paid.

For women who qualify for MA due to unpaid work for the business of a spouse or partner, the benefit pays the minimum rate.

Table 2.20 reports rates and thresholds for MA during selected policy years.

Table 2.20 Maternity Allowance Rates and Thresholds (£ per week)

	2020	2021	2022	2023	2024	2025	2026
minimum earnings threshold	30.00	30.00	30.00	30.00	30.00	30.00	30.00
earnings ceiling (%)	90	90	90	90	90	90	90
maximum rate	151.97	151.97	156.66	172.48	179.37	181.39	184.10
minimum rate	45.59	45.59	47.00	51.74	53.81	54.42	55.23

Source: Rates to 2023 set by legislation. Rates from 2024 maximum rate indexed to reflect earnings growth, minimum earnings threshold frozen.

Influence on taxes and benefits

MA is not taxable. It does not affect entitlement to tax credits but it may affect the amount of other benefits, including Council Tax Reduction, Housing Benefit, Employment and Support Allowance, Income Support, Jobseeker's Allowance, bereavement benefits, Carer's Allowance, and Universal Credit. MA is limited by the benefit cap when received in combination with Housing Benefit or Universal Credit.

Model note: MA, together with Statutory Maternity and Paternity Pay (sections 2.5.22 and 2.5.23), is simulated by UKMOD as part of the "Parental Leave Benefits" model extension (PBE, see section 2.3), which is off by default.

2.5.17 Pension Credit (*boamt_s*)

Pension Credit (PC) is an income maintenance benefit paid to those over State Pension age (defined in section 1.1, paragraph c). PC is comprised of two elements: the Guarantee Credit (GC, *boamtmm_s*) which acts as a safety-net to ensure a minimum level of income in retirement; and the Saving Credit (SC, *boamtxp_s*) which mitigates the effective benefits withdrawal rate with private income above the value of the basic State Pension. Either or both GC and SC can be received, with the total PC entitlement being the sum of the two. Housing costs provisions of the PC mirror those described for Income Support (section 2.5.12), except that deductions for housing can be made under both Housing Benefit and PC (which is not permitted for Income Support).

Model note: PC is implemented in the same policy as Income Support and income-based Jobseeker's Allowance as the rules governing each benefit are broadly similar.

Guarantee Credit (boamtmm_s)

To receive the GC, individuals must be over the relevant (women's) State Pension age and have benefit unit income (*il_GC_means*) that is less than the 'applicable amount' of the benefit unit.

The 'applicable amount' is the aggregate of personal allowances and premia. The personal allowances for the GC are sometimes referred to as the 'standard minimum income guarantee'. Values for personal allowances and premia of the GC are reported for selected years in Table 2.21.

Table 2.21 Guarantee Credit Allowances, Premia and Thresholds (£ per week)

	2020	2021	2022	2023	2024	2025	2026
Allowances							

single	177.10	177.10	182.60	201.05	213.50	218.85	224.35
couple	270.30	270.30	278.70	306.85	325.85	334.00	342.35
Premia							
severe disability - single	67.30	67.30	69.40	76.40	80.55	81.00	81.00
severe disability - couple	134.60	134.60	138.80	152.80	161.05	162.00	162.00
carer premium - single	37.70	37.70	38.85	42.75	45.05	45.30	45.35
carer premium - couple	37.70	37.70	38.85	42.75	45.05	45.30	45.35
capital disregard (£)	10000	10000	10000	10000	10000	10000	10000

Source: Rates to 2023 set by legislation. Allowances from 2024 indexed by the triple lock, equal to price growth, average earnings growth, or 2.5% p.a., whichever is greatest. Premia indexed to reflect price (CPI) growth, and the capital disregard is frozen.

Assessable income

Assessable income includes income of any adult in the benefit unit (the claimant and the partner if any), while income of dependent children is ignored (*il_GC_means*). Assessable income includes earnings, benefits and tax credits, maintenance payments, and tariff income from capital evaluated at the rate of £1 for every £500 over a disregard (see **Error! Reference source not found.**). Unlike for working-age claimants of Income Support, there is no maximum capital limit for PC.

Benefit amounts

The GC pays the relevant ‘applicable amount’ less ‘assessable income’.

The Savings Credit (boamtxp_s)

To receive the SC, either the claimant or their partner must have been above State Pension age on 6 April 2016, with qualifying income above the Savings Credit threshold. Table 2.22 reports values for the Savings Credit thresholds alongside associated upper limits imposed on the value of SC payable.

Qualifying income

Qualifying income for SC (*il_SC_qualy*) is the same as assessable income for the GC, but with certain (work-related) benefits subtracted. The omitted benefits include Working Tax Credit, Incapacity Benefit, contributions-based Employment and Support Allowance and Jobseeker’s Allowance, Severe Disablement Allowance, Maternity Allowance, and maintenance payments.

Benefit amounts

The value of the savings credit is obtained by:

1. Calculating 60% of qualifying income above the SC threshold
2. Identifying the minimum of (1) and the SC maximum benefit.
3. Calculating 40% of assessable income above the GC applicable amount.
4. Subtracting (3) from (2), subject to a lower bound of zero.

The process identified above may appear somewhat obscure. It is designed to return a benefit that is subject to a 100% withdrawal rate on private income up to the SC threshold, followed by a 40% withdrawal rate until the benefit is exhausted. To see this, note that the SC maximum benefit values reported in Table 2.22 are equal to 60% of the difference between the applicable amount of the GC and the SC threshold (so that the 100% withdrawal rate of the GC is off-set by a 60% rebate in the form of the SC).

Table 2.22 Savings Credit Thresholds, Maxima, and Withdrawal Rates (£ per week)

	2020	2021	2022	2023	2024	2025	2026
Thresholds							
single	153.70	153.70	158.47	174.49	185.31	189.94	194.69
couple	244.12	244.12	251.70	277.12	294.30	301.66	309.20
Maximum benefit							
single	14.04	14.04	14.48	15.94	16.93	17.35	17.78
couple	15.71	15.71	16.2	17.84	18.95	19.42	19.91
withdrawal rate (%)	40	40	40	40	40	40	40

Source: Rates to 2023 set by legislation. Rates from 2024 indexed by the triple lock, equal to price growth, average earnings growth, or 2.5% p.a., whichever is greatest.

Influence on taxes and benefits

PC is not taxable.

Model note: UKMOD applies a take-up correction to this benefit by default. See section 3.2.3 for more information.

2.5.18 School Clothing Grant (*bched02_s*)

School Clothing Grants (SCG) are available throughout the UK to help low-income families meet school clothing costs.

Eligibility

SCG is administered by local councils and authorities throughout the UK, and the terms of eligibility consequently vary. UKMOD simulates eligibility to SCG in the same way as described for the means-tested component of Free School Meals (section 2.5.9, non-infant component).

Benefit amounts

The value of benefits received in the form of SCG is assumed to vary between primary and secondary school students as reported in. These values are based on financial statistics reported for local government in Scotland.

Table 2.23 School Clothing Grant Values (£ per year)

	2020	2021	2022	2023	2024	2025	2026
primary school	116.01	116.01	119.11	129.89	135.26	136.08	136.05
secondary school	156.78	156.78	160.96	175.53	182.79	183.9	183.86

Source: Rates to 2020 set by legislation. Rates from 2021 indexed to reflect price (CPI) growth.

Influence on taxes and benefits

Benefits provided in the form of SCG are not taxable. They are not counted as income or capital for means-tested benefits or tax credits. SCG are not affected by the benefit cap.

2.5.19 Scottish Carer's Allowance Supplement (*bcrdicm_s*)

Scottish Carer's Allowance Supplement is an additional payment for people in Scotland who receive Carer's Allowance. It was first paid in September 2018 and is included in the UKMOD baseline from that year onwards.

Eligibility

Scottish carers in receipt of the UK Carer's Allowance.

Benefit amounts

Annual rates of benefit are reported in Table 2.24.

Table 2.24 Scottish Carer's Allowance Supplement Rates (£ per year)

2020	2021	2022	2023	2024	2025	2026
462.8	462.8	491.4	540.8	570.1	573.3	573.4

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Influence on taxes and benefits

The Carer's Allowance Supplement does not affect other benefits or tax credits. Carer's Allowance Supplement is taxable.

2.5.20 Scottish Child Payment (*bchmt_s*)

The Scottish Child Payment (SCP) is provided by the Scottish Government to families living in Scotland with children. The first benefit payment was made in February 2021.

Eligibility

Eligibility for SCP is passported by receipt of Universal Credit, or one of the associated legacy benefits: Child Tax Credit, Working Tax Credit, Income Support, income-based Jobseeker's Allowance, income-based Employment and Support Allowance or Pension Credit.

The first benefit payment was paid in February 2021 for eligible families with children up to the age of 5. In December 2022, benefit provision was expanded to families with children up to the age of 15.

Benefit amounts

The benefit amount is outlined in Table 2.25.

Table 2.25 Scottish Child Payment Amounts (£ per week)

2020	2021	2022	2023	2024	2025	2026
10	10	20	25	26	26	26

Source: Rates to 2024 set by legislation. Rates from 2025 indexed to reflect price (CPI) growth.

The Scottish Fiscal Commission assumes a benefit take-up rate lower than 100% which is also accounted for in the benefit calculations in UKMOD (see section 3.2.3).

Influence on taxes and benefits

The SCP is not taxable, does not count as income or capital for means-tested benefits or tax credits, and is not affected by the benefit cap.

2.5.21 Scottish Child Winter Heating Assistance (*bchht_s*)

The Scottish Child Winter Heating Assistance is provided by the Scottish Government to children and young people in Scotland receiving the highest rate care component of Disability Living Allowance. The benefit is paid out on an individual basis.

Eligibility

Child and young people aged under 18 years who receive the highest rate care component of Disability Living Allowance (DLA). The first benefit payment was made in winter 2020.

Benefit amounts

Benefit amounts are reported in Table 2.26.

Table 2.26 Scottish Child Winter Heating Assistance Amounts (£ per year)

2020	2021	2022	2023	2024	2025	2026
200	200	214.1	235.7	248.45	249.85	249.9

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Influence on taxes and benefits

The Scottish Child Winter Heating Assistance is not taxable; does not count as income or capital for means-tested benefits or tax credits; and is not affected by the benefit cap.

Model note: The FRS interviews adults aged 16 and over, except those aged 16 to 19 who are unmarried and still in full-time education or unwaged training. Thus, receipt of DLA is reported by adults only. The model attributes receipt of DLA with reference to declared disability (*ddi* = 1). As a result, we underestimate the number of eligible children and the amount of benefit spending on the Scottish Child Winter Heating Assistance.

2.5.22 Statutory Maternity Pay (*bmaer, bmact_s*)

Statutory Maternity Pay (SMP) is a weekly payment made by employers to their employees or former employees. Employers pay SMP to women who have been in their employment prior to becoming pregnant and during their pregnancy.

Eligibility

There are two basic rules to qualify for SMP:

- Continuous employment rule: the mother must have been employed for a continuous period of at least 26 weeks into the qualifying week (which is the 15th week before the week in which the baby is due). This period must include at least one day employment in the qualifying week. However, there are some circumstances when breaks in employment can be disregarded.
- Earnings rule: average gross weekly earnings must be at least equal to the lower earnings limit (LEL) for National Insurance (NI) purposes.

Benefit amounts

SMP is available for up to 39 weeks. The first six weeks are paid at 90% of the mother's average weekly earnings, and the next 33 weeks are paid at the lesser of a fixed rate or 90% of the mother's average weekly earnings. SMP can be paid from 11 weeks before the week in which the baby is due, but only if the mother stops work before then. If she continues working on or after 11 weeks before the baby is due, then she can choose the day she wants SMP to start up to the date of birth.

The qualifying week is 15 weeks before the baby is due. The definition of a week for the qualifying week is a period of 7 days that begins at midnight between Saturday and Sunday.

No additional SMP is payable for multiple births or adoptions.

Table 2.27 Statutory Maternity Rates and Thresholds (£ per week)

	2020	2021	2022	2023	2024	2025	2026
% of earnings	90	90	90	90	90	90	90
lower earnings limit	120.00	120.00	123.00	123.00	130.00	130.00	130.00
standard rate	151.97	151.97	156.66	172.48	179.37	181.39	184.10

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Influence on taxes and benefits

SMP is treated as earnings and the employer will apply any deductions (such as Income Tax, NI contributions, pensions' contributions) that are due.

Model note: In UKMOD the benefit duration is modelled as being received 11 weeks before birth and 28 weeks after birth. SMP, together with Maternity Allowance and Statutory Paternity Pay (sections 2.5.16 and 2.5.23), is simulated by UKMOD as part of the "Parental Leave Benefits" model extension (PBE, see section 2.3), which is off by default.

2.5.23 Statutory Paternity Pay (*bpact_s*)

A child's male legal guardian is entitled to 2 weeks Statutory Paternity Pay (SPP) after the birth of their child. Paternity leave can be taken within 56 days (8 weeks) of the actual date of birth, or the expected date of birth if the child is born early.

Eligibility

The same as for Statutory Maternity Pay (section 2.5.22).

Benefit amounts

90% of the father's average weekly earnings, or the Statutory Maternity Pay standard rate, whichever is less.

Influence on taxes and benefits

SPP is treated as earnings and the employer will apply any deductions (such as Income Tax, NI contributions, pensions' contributions) that are due.

Model note: SPP, together with Maternity Allowance and Statutory Maternity Pay (sections 2.5.16 and 2.5.22), is simulated by UKMOD as part of the "Parental Leave Benefits" model extension (PBE, see section 2.3), which is off by default.

2.5.24 Sure Start Maternity Grant (*bmamt_s*)

The Sure Start Maternity Grant is a one-off payment to help towards the costs of having a child. In Scotland, from late 2018 the Sure Maternity Grant was replaced by the Best Start Grant (section 2.5.3).

Eligibility

A woman usually qualifies for the grant if she is expecting her first child, or a multiple birth (such as twins) and is in receipt of one of the following benefits:

- Income Support
- income-based Jobseeker's Allowance
- income-based Employment and Support Allowance
- Pension Credit
- Child Tax Credit
- Working Tax Credit that includes a disability or severe disability element
- Universal Credit.

The grant can be claimed up to 11 weeks before the baby's due date and up to 6 months after the baby's birth.

Benefit amounts

The amount a one-off payment of £500.

Influence on taxes and benefits

The Sure Start Maternity Grant is not taxable and is not counted as income or capital for means-tested benefits or tax credits. The Sure Start Maternity Grant is not affected by the benefit cap.

2.5.25 Universal Credit (*bsauc_s*)

Universal Credit (UC) is currently replacing a range of social assistance benefits for working-age people on a low income who are in or out of work. The scheme represents a major restructuring of the UK social assistance system and has been rolled out progressively since October 2013. UC replaces the following 'legacy' benefits:

- Income Support
- Jobseeker's Allowance (income-based)
- Employment and Support Allowance (income-based)
- Housing Benefit
- Child Tax Credit
- Working Tax Credit

UC is paid monthly, or twice a month for some people in Scotland.

Eligibility

One claim for UC is made per benefit unit and eligibility is based on 'basic conditions' and 'financial conditions'. Basic conditions are that the claimant is over 18, under State Pension age, and not in education. Financial conditions are that the claimant's benefit unit has sufficiently low income and capital.

Exceptions to the basic conditions apply for 16 and 17-year-olds with limited capabilities for work; exemptions also apply for those exempt from looking for work because they hold 'regular and substantial caring responsibilities for a severely disabled person', e.g. carers, or lone parents, or people on unpaid parental leave.

Members of a couple should apply jointly. Both partners must satisfy the above conditions of entitlement and their income and capital is assessed jointly. However, they do not need to meet the basic age condition (i.e. if one of them is over State Pension age or receiving education).

Claimants of UC do not need to have paid National Insurance contributions to qualify.

Benefit amounts

The amount of UC payable to a benefit unit that satisfies the eligibility conditions is identified by the following calculation:

1. Evaluate the UC "maximum amount",
2. Identify "net earned income",
3. Identify "unearned income",
4. Evaluate the UC entitlement.

Model note: Before 16 January 2019, if members of a benefit unit were severely disabled and transferring from a 'legacy' means-tested benefit to UC, they would receive a 'transitional protection' payment (a top-up to ensure that the UC payment was not less than the legacy benefit. UKMOD does not account for transitional protection payments as sufficient data do not exist for their identification.

<u>Maximum amount</u>

The UC maximum amount notionally represents the net income that a benefit unit should be expected to live on. It is evaluated as the sum of a single "standard allowance" and as many "elements" as apply to a benefit unit's circumstances. The standard allowances vary by age and relationship status. Elements reflect a range of benefit unit characteristics, including the number of dependent children, disability, housing costs, childcare costs, and carer responsibilities.

One of the factors that UC takes into consideration is a claimant's ability to work, which is identified via a 'Work Capability Assessment'. The work capability assessment places each claimant in one of three groups:

- limited capability for work and work-related activity' (LCWRA)
- limited capability for work (LCW)
- fit for work (FFW)

A claimant that is assessed as LCWRA has no work-related activity conditions attached to receipt of UC. A claimant that is assessed as LCW is not expected to look for work but must agree to prepare for work at some point in the future as a condition for receiving UC. A claimant that is assessed as FFW must agree to look for work as a condition for receiving UC.

Model note: UKMOD distinguishes LCWRA from LCW on the basis of the reported duration that a person has been affected by disability (*ddipd*): LCWRA requires the duration to be at least a year, while LCW is between 26 weeks and 1 year. Otherwise both LCW and LCWRA in the model require either reported earnings (*ils_earns*) to be less than working 16 hours at the National Living Wage rate (section 2.4), or receipt of Attendance Allowance (*bdoa*), Disability Living Allowance (*bdisc*, *bdimb*), or Personal Independence Payment (*bdiscwa*, *bdimbwa*). If none of these conditions are met, then UKMOD assumes that an individual is FFW. Furthermore, the housing costs element included in UC is calculated in a similar manner as described for Housing Benefit (section 2.5.11).

Table 2.28 reports allowances and elements assumed by UKMOD.

Table 2.28 Universal Credit Allowances and Elements (£ per month)

	2020	2021	2022	2023	2024	2025	2026
Standard allowances							
single under 25	257.33	344.00	265.31	292.11	307.92	309.67	309.72

single 25+	324.84	411.51	334.91	368.74	388.70	390.91	390.98
couple, both under 25	403.93	490.60	416.45	458.51	483.32	486.07	486.15
couple, at least one 25+	509.91	596.58	525.72	578.82	610.15	613.62	613.72
Additional elements							
child element:							
born before 6/4/2017	282.50	282.50	290.00	315.00	315.00	315.00	315.00
born after 6/4/2017	237.08	237.08	244.58	269.58	284.17	285.79	285.84
childcare element:							
1 child	646.35	646.35	646.35	951.00	1002.47	1008.17	1008.34
2+ children	1108.04	1108.04	1108.04	1630.00	1718.22	1727.99	1728.28
Limited capability for work:							
LCW element	128.89	128.89	132.89	146.31	154.23	155.11	155.14
LCWRA element	343.63	343.63	354.28	390.06	411.17	413.51	413.58
carer's element	163.73	163.73	168.81	185.86	195.92	197.03	197.06
disabled child addition:							
per child with PIP/DLA	128.89	128.89	132.89	146.31	154.23	155.11	155.14
per child, severe disability	273.52	273.52	281.99	310.58	327.39	329.25	329.30

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth, except childcare elements and child element for children born before 2017 which are frozen.

Net earned income

Assessable net earnings (*il_UC_means_earned*) include earnings from employment (including odd jobs), statutory maternity, paternity and sick pay (sections 2.5.22 and 2.5.23, *bhlwk*) of all adult members of a benefit unit, measured net of income taxes and National Insurance contributions.

A claimant's earnings from employment are set to the maximum of their realised employment income and (for self-employed) the 'minimum income floor' (MIF). This permits self-employed people, who are not required to seek employment, to receive UC while they build their business. The MIF is applied unless the claimant is exempt because (*i_mif_exempt*) they[12]:

- look after a child under 3 years of age, or
- care for a severely disabled person, or
- care for a friend or family members, or
- have been assessed as LCW or LCWRA, or
- are in full-time education, or
- are above State Pension age, or
- have been self-employed for less than 12 months.

Model note: Due to data limitations, the following exemption conditions from the MIF are not taken into account: pregnant and within 12 weeks of the baby's due date; given birth in the previous 15 weeks; adopted a child within the last 12 months; a foster parent of a child under 16; under threat of domestic violence or recently have been.

The MIF is the product of the National Minimum Wage relevant for the claimant (section 2.4) and the hours of work that they are expected to do (*i_mif_h*):

- 16 hours if a parent of a dependent child aged between 3 and school age (5), or
- 25 hours if a parent of a dependent child aged between school age (5) and 13, or

[12] The MIF was also suspended during the Covid-19 crisis.

- 35 hours otherwise.

If the benefit unit is comprised of a couple, then both the claimant and partner earnings are subject to the MIF (*i_mif_sey* and *i_mif_py*, respectively).

Model note: MIF gross of National Insurance and income tax, *i_mif_y*, is evaluated in policy *mif_uk*. MIF net of transfer payments is evaluated in two loops (labelled *nic* and *tin*) within the UC policy *bsauc_uk*. Each loop runs twice. In the first run, tax-benefit calculations are carried out that consider a person's reported earnings. In the second run, the person's reported earnings are replaced with the gross MIF (*i_mif_y*). The results from each of these calculations are stored in separate variables, from which MIF net of transfer payments (*i_mif*) is derived.

Unearned income

Unearned income (*il_UC_means_unearned*) aggregates most sources of benefit unit income not included in "earned income", excluding income of dependent children. This includes property income, personal (private and occupational) pensions, contributory benefits (Jobseeker's Allowance, Employment and Support Allowance, State Pension), and other sources of non-labour income (Carer's Allowance, maintenance payments, Maternity Allowance, Widow's Pension, War Pension, student loans). Note that Child Benefit, Council Tax Reduction, Personal Independence Payment, Attendance Allowance and Disability Living Allowance are ignored.

Property income is included indirectly via an imputed tariff, at the rate of £1 per week for every £250 of capital above a minimum threshold. Eligibility for UC is cut for any benefit unit with capital above an upper threshold. See Table 2.29 for threshold rates applied in selected years reported.

Entitlement evaluation

The UC entitlement is given by the "maximum amount" minus "excess earned income" minus "unearned income".

Excess earned income is obtained by multiplying an income taper by net earned income above applicable "work allowances". Work allowances are provided to benefit units with one or more dependent children and/or adults identified with a limited capability to work (LCW or LCWRA). These allowances vary by whether a housing costs element is included in the evaluated maximum amount. Work allowances and income tapers for selected years are reported in Table 2.29.

Table 2.29 Universal Credit Disregards, Thresholds, and Income Tapers

	2020	2021	2022	2023	2024	2025	2026
Work allowances (£ per month)							
with housing costs help	293.00	293.00	344.00	379.00	400.00	402.00	402.00
without housing costs help	515.00	515.00	573.00	631.00	665.00	669.00	669.00
income taper (%)	63	63	55	55	55	55	55
Capital limits (£)							
lower limit	6000	6000	6000	6000	6000	6000	6000
upper limit	16000	16000	16000	16000	16000	16000	16000

Source: Rates to 2022 set by legislation. Rates from 2023 indexed to reflect price (CPI) growth, except capital limits which are frozen.

Influence on taxes and benefits

UC is not taxable. Claimants cannot get Pension Credit and UC at the same time. Single people must be under the qualifying age for Pension Credit (State Pension age for women). Until May

2019, couples with only one partner who has reached State Pension age ('mixed-age couple') could choose between claiming UC and PC. From May 2019, a mixed-age couple can only choose to claim PC instead of UC. UC can be paid in addition to non-means-tested benefits such as contributions-based JSA and contributions-based ESA, but they count as (unearned) income when UC is calculated.

The UC is subject to the benefits cap (section 2.5.1).

UKMOD applies a take-up correction to UC by default. UC take-up is implemented in a way that is consistent with legacy benefits. Specifically, individuals identified as taking-up legacy benefits are also identified as taking-up UC (if eligible), and vice versa. If an individual is not eligible for legacy benefits, but is for UC, UKMOD applies the same probability of take-up as assumed for Income Support by families without children. See section 3.2.3 for more information.

Transition from Legacy Benefits

During the roll-out period for UC, legacy benefits and UC are simulated simultaneously. Claimants are randomly allocated to either UC or legacy benefits based on Department for Work and Pensions estimates and Office for Budget Responsibility forecasts.

Sensitivity analysis concerning the effects of the transition from legacy benefits to UC can be explored via the LBA (Full Legacy Benefits Assumption) and UCA (Full Universal Credit Assumption) model extensions (section 2.3). It is also possible to adjust the speed of transition between legacy benefits and UC by manually adjusting the model parameter *$UCtransition.*

2.5.26 Winter Fuel Allowance (*boaht_s*)

Winter Fuel Allowance (WFA) is an annual allowance intended to cover extra heating costs for elderly people during winter months. The benefit is paid at the household level (*tu_household_uk*).

Eligibility

Winter Fuel Allowance (WFA) is paid to any household with a person over the State Pension age.[13]

Benefit amount

The benefit amounts and age thresholds for the Winter Fuel Allowance are reported in the Table 2.30.

Table 2.30 Winter Fuel Allowance Amounts by Age of Eldest household Member (£ per year)

	2020	2021	2022	2023	2024	2025	2026
from State Pension age	200.00	200.00	200.00	200.00	200.00	200.00	200.00
from age 80	300.00	300.00	300.00	300.00	300.00	300.00	300.00

Source: Rates to 2022 set by legislation. Rates from 2023 assumed frozen.

Influence on taxes and benefits

The WFA is not taxable and is not counted as income or capital for means-tested benefits or tax credits. The WFA is not affected by the benefit cap.

[13] State Pension age of women was used when this differed from men.

Model note: The Winter Fuel Allowance is assumed to be shared equally between all eligible household members.

2.5.27 Working Tax Credit (*bwkmt_s*)

Working Tax Credit (WTC), like Child Tax Credit (section 2.5.5), is an income-tested refundable tax credit. In practice, WTC is calculated in common with welfare benefits as distinct from Income Tax liabilities, and its treatment in UKMOD reflects this. WTC is calculated with respect to the previous tax year's annual income. In common with most of the UK tax and benefit system, the 'assessment unit' for CTC is the benefit unit.

In principle WTC is responsive to changes in income or other circumstances, which claimants are required to report. There is also an end-of-year settlement to adjust for unaccounted changes during the year, subject to an income disregard. Data limitations require UKMOD to simulate entitlements entirely on income reported during the Family Resources Survey sample period, so that it is not possible to adjust for associated income variation during the year. This is essentially equivalent to assuming that the end of year income disregard is very large.

Eligibility

WTC is an income-based credit for working adults who are either (*i_bwfmt_ChildDLA1* = 1)

- working at least 30 hours per week and aged above 24 years old; or
- working at least 16 hours per week and have a dependent child; or
- working at least 16 hours per week and disabled; or
- working at least 16 hours per week and age 60+ (from 2011); or
- if a couple with children, working at least 24 hours per week in total with at least one adult working at least 16 hours per week; or
- if a couple where the partner receives Carer's Allowance, working at least 16 hours per week in total.

Benefit amounts

The WTC and Child Tax Credit are subject to a common means-test; see section 2.5.5 for related detail. The principal difference between the two schemes is the definition of the 'maximum amount' of benefit.

The maximum amount of the WTC is the sum of the family, disability, and hours worked elements. There is also a childcare element (*i_bwkmt_ChildCare*) to meet the cost of 'relevant childcare' (*xcc*). Those eligible are lone parents in employment or couples with both partners in employment, or one partner receiving disability benefits. 'Relevant childcare' refers to registered childcare for which the childcare element can be claimed. The calculation of the childcare tax credit element is based on average weekly amounts. The childcare element is designed to meet 70% of those costs up to a set limit. Simulated rates are reported in Table 2.31.

Table 2.31 Working Tax Credit Maximum Amounts (£ per year)

	2020	2021	2022	2023	2024	2025	2026
basic element	2005	2005	2070	2280	2405	2415	2415
lone parent element	2060	2060	2125	2340	2465	2480	2480
couple element	2060	2060	2125	2340	2465	2480	2480
30 hours element	830	830	860	950	1000	1005	1005
disability element	3240	3240	3345	3685	3885	3905	3905
severe disability element	1400	1400	1445	1595	1680	1690	1690

eligible childcare expenditure (£ per week)							
maximum 1 child	175	175	175	175	175	175	175
maximum 2+ children	300	300	300	300	300	300	300

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth, except eligible childcare expenditure which is frozen.

Influence on taxes and benefits

Like Child Tax Credit, WTC counts in full as income for HB and CTR, so needs to be simulated before these means-tested benefits. It is not taxable, so it can be simulated after income taxes.

UKMOD applies a take-up correction to WTC by default. See section 3.2.3 for more information.

2.6 Social contributions

As for the description of social benefits in section 0, this section is limited to social contribution schemes that affect at least 2 policy years. See Annex 6.5 for details concerning schemes omitted here (Health and Social Care Levy).

2.6.1 Employee National Insurance contributions (*tscee_s*)

Eligibility

Employees between the ages of 16 and State Pension age are subject to Class 1 contributions on their gross earnings (*il_empNIearns*).

Contribution amounts

Class 1 National Insurance contributions depend on weekly earnings from employment (*yem*) as well as earnings replacement benefits paid by the employer, including Statutory Sick Pay (*bhlwk*), Statutory Maternity Pay (*bmana*), and Statutory Paternity Pay (bpact_s).

Contributions are paid on earnings between the Primary Threshold (PT) and the Upper Earnings Limit (UEL). Earnings above the UEL are subject to a lower rate. Table 2.32 reports thresholds and rates applicable for selected years.[14]

Table 2.32 Class 1 (Employee) National Insurance Contribution Gross Earnings Limits and Rates

	2020	2021	2022	2023	2024	2025	2026
Earnings limits (£ per week)							
Primary Threshold (PT)	184.00	184.00	190.00	242.00	242.00	242.00	242.00
Upper Earnings Limit (UEL)	967.00	967.00	967.00	967.00	967.00	967.00	967.00
Rates (%)							
between PT and UEL	12	12	12	12	12	12	12
above UEL	2	2	2	2	2	2	2

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

[14] Women who are married or divorced and opted out before 1977 pay a lower rate of 5.85% (in 2013) applying to earnings between PT and UEL. However, since this can only apply to married/divorced women aged 50 or more, and only to those continuously in the labour force since 1977 the numbers affected are now small and we do not identify these cases or simulate this lower rate of contribution. Prior to 2016, lower contribution rates applied to earnings between PT and UEL if an employee was contracted-out of additional State Pensions (*lim*=0). See section 1.3 for further discussion.

2.6.2 Self-employed National Insurance contributions (*tscse_s*)

Eligibility

People with income from self-employment (*yse*) may be subject to Class 2 and Class 4 contributions.

Contribution amounts

Class 2 contributions are paid at a flat rate by people whose yearly profit/self-employment income (*yse*) exceeds the so-called 'Small Profits Threshold'. Table 2.33 reports rates and thresholds for Class 2 contributions in selected years.

Table 2.33 Class 2 (Self-employment) National Insurance Contributions Rates

	2020	2021	2022	2023	2024	2025	2026
flat rate (£ per week)	3.05	3.05	3.15	3.45	3.65	3.65	3.65
small profits threshold (£ per year)	6515	6515	6725	6725	7090	7130	7130

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

Class 4 contributions are paid on self-employment income (*yse*) between a Lower Profits Limit (LPL) and an Upper Profits Limit (ULP) (*i_NIclass4_onlyselfempl_bwLPLandUPL*) with a lower rate applying on income above the upper limit (*i_NIclass4_onlyselfempl_aboveUPL*). Table 2.34 reports rates and thresholds for Class 4 contributions in selected years.

Table 2.34 Class 4 (Self-employment) National Insurance Profit Limits and Rates

	2020	2021	2022	2023	2024	2025	2026
Profit limits (£ per year)							
Lower Profits Limit (LPL)	9568	9568	11908	12570	12570	12570	12570
Upper Profits Limit (UPL)	50270	50270	50270	50270	50270	50270	50270
Rates (%)							
between LPL and UPL	9	9	9	9	9	9	9
above UPL	2	2	2	2	2	2	2

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

<u>National Insurance for people with earnings both as employees and self-employed</u>

Class 4 contributions are subject to an annual maximum for people who have both employment (*yem*) and self-employment earnings (*yse*). It is calculated as follows:

1. First the maximum Class 2 and Class 4 contributions on earnings under the UPL is calculated as the sum of Class 4 contributions payable on profits between the UPL and the LPL and 53 times the weekly flat rate Class 2 contributions (*i_combined_bwLPLandUPL*);
2. Any Class 1 and Class 2 contributions actually paid during the year are subtracted from the total obtained in step (1), giving the maximum amount of Class 4 contributions payable at the main (higher) rate (*i_selfempl_income_bwLPLandUPL*);
3. The profit necessary to pay Class 4 contributions equal to those defined in step (2) is evaluated and substitutes for the UPL of the contributor in the respective year.

2.6.3 Employers' social insurance contributions (*tscer_s*)

Eligibility

Employers pay secondary Class 1 National Insurance contributions for each employee aged 16 years or older that is paid earnings above the 'Secondary Threshold'.

Contribution amounts

Contributions are paid at a single rate on all employee earnings above the Secondary Threshold.[15] Table 2.35 reports rates and thresholds for employers` National Insurance contributions.

Table 2.35 Employers' National Insurance Contributions Thresholds (£ per week) and Rates (%)

	2020	2021	2022	2023	2024	2025	2026
Secondary Threshold (ST)	170	170	175	175	175	175	175
rate above ST (%)	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

2.7 Personal income tax (*tin_s*)

Income tax in the UK is paid on "taxable income" above relevant "allowances".[16] Taxes are levied at the level of the individual, so that the incomes of each member of a married couple are taxed independently. Two exceptions to independent taxation have been introduced. First, in 2013 the "high-income child benefit charge" was added, which takes into consideration income for both an individual and their partner to determine associated tax liability (see section 2.5.4). Second, in 2015 the "Marriage Allowance" (see section 2.7.2) was introduced, which allows a person to transfer some of their unused personal allowances to their spouse or civil partner.

2.7.1 Taxable income (*il_tinty*)

The UK income tax base is broad, accounting for most forms of earned and unearned income. This includes earnings of employees and the self-employed, (private and state) age pensions, property income, and investment returns. In contrast, most social benefits are omitted from the tax base, as discussed in section 0.

UKMOD simulates taxable income (*il_tinty*) as the sum of:

- Earnings from employment and benefits from employer (*yem* + *bmaer* + *bhlwk* + *bmact_s* + *bpact_s*);
- Earnings from self-employment (*yse*);
- State, occupational, personal and widow's pensions (*boact00* + *boactcm* + *ypp* + *bsuwd*);
- Carer's Allowance and Supplement (*bcrdi*, *bcrdicm_s*);
- Incapacity Benefit[17] (*bdict01*);
- Contributions-based Employment Support Allowance (*bdict02*);
- Contributions-based Jobseeker's Allowance (*bunct_s*);

[15] Prior to 2016, a lower employer rate was payable on earnings between the PT and UEL for contracted out employees (*lim*=0).
[16] The Working Tax Credit and Child Tax Credit are considered as benefits by UKMOD and are described in section 0.
[17] According to the legislation, IB is taxed only after the first 28 weeks of payment. UKMOD assumes that receipt has exceeded 28 weeks, as the duration of IB receipt is not reported.

- Rental income from a second property or over certain limits (*yprtx*);
- Interests and dividends, omitting returns to Individual Savings Accounts and Personal Equity Plans (*yiytx*);
- Other income (from odd jobs) (*yot01*)

Contributions to personal, private and occupational pensions (*xpp*, *tpcpe*) are deducted from the measure of taxable income.

Although income-based Jobseeker's Allowance is taxable, it is omitted from the simulated measure of taxable income as discussed in section 2.5.12. Furthermore, although losses from self-employment can be carried forward to subsequent tax years, UKMOD assumes only that they can off-set other taxable income within the same year.

2.7.2 Allowances (*tinta_s, tinsa_s*)

Several allowances have been associated with UK income taxes. The "Personal Allowance" (*i_tinta_PersAllow*) is a common allowance applicable for all taxpayers. From 2010, Personal Allowances have been subject to a taper rate on taxable income above an "upper income threshold". Rates and thresholds for Personal Allowances in selected years are reported in Table 2.36.[18]

Table 2.36 Personal Allowance Rates and Thresholds (£ per year)

	2020	2021	2022	2023	2024	2025	2026
Personal Allowance	12570	12570	12570	12570	12570	12570	12570
upper income limit	100000	100000	100000	100000	100000	100000	100000
taper rate (%)	50	50	50	50	50	50	50

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

From 2016, a Personal Savings Allowance (*tinsa_s*) shields interest earned from a range of savings vehicles.[19] The size of the Personal Savings Allowance depends on the marginal tax rate paid on other income, as shown in Table 2.37. Income earned from tax-free products (i.e Individual Saving accounts (ISA) or National & Saving Investments (N&SI)) does not count towards the Personal Savings Allowance.

Table 2.37 Personal Savings Tax Allowances (£ per year)

	2020	2021	2022	2023	2024	2025	2026
basic rate taxpayers	1000	1000	1000	1000	1000	1000	1000
higher rate taxpayers	500	500	500	500	500	500	500
additional rate taxpayers	0	0	0	0	0	0	0

Source: Rates to 2023 set by legislation. Rates from 2024 assumed frozen.

Transferable Allowances

From April 2015, the Marriage Allowance allows one partner of a couple to transfer unused personal allowance to their partner, up to an upper threshold. Couples where both partners were born before 6 April 1935 can choose to receive the Married Couples Allowance (described below) instead of the Marriage Allowance. The partner receiving the transfer must be paying less than

[18] In practice, there is also a "Blind Person's Allowance" added to the Personal Allowance, but this is ignored in the model due to data limitations.

[19] Including bank and building society accounts, savings and credit union accounts, unit trusts, investment trusts and open-ended investment companies, peer-to-peer lending, trust funds, payment protection insurance (PPI), government or company bonds, life annuity payments, and some life insurance contracts.

the “higher rate” of income tax. Upper thresholds for the transferrable personal allowances under the Marriage Allowance for selected years are reported in Table 2.38.

Table 2.38 Transferable Personal Tax Allowances for Married Couples (£ per year)

2020	2021	2022	2023	2024	2025	2026
1260	1260	1260	1260	1260	1260	1260

Source: Rates to 2023 set by legislation. Rates from 2024 assumed frozen

Legacy Allowances

The Married Couples Allowance and Additional Personal Allowances for lone parents were abolished in 2001. Age Allowances were also provided to people over State Pension age, but were abolished in 2016.

Nevertheless, taxpayer couples where at least one partner was born before 6 April 1935 remain eligible for the Married Couples Allowance (*i_tin_prelimMCA*). The MCA must be claimed by the husband if the couple married before 2005, or by the partner with the highest income otherwise.[20] Any unused MCA can be transferred to the spouse or civil partner (*i_tin_unusedMCA*).

The age and married couples allowances were both withdrawn at the rate of £1 for every £2 of taxable income earned in excess of the upper income limit (see Table 2.36), subject to minimum allowance rates. MCA levels for selected policy years are listed in Table 2.39.

Table 2.39 Married Couples Allowance (£ per year)

	2020	2021	2022	2023	2024	2025	2026
allowance	9125	9125	9415	10375	10935	11000	11000
minimum	3530	3530	3640	4010	4335	4385	4430

Source: Rates to 2023 set by legislation. Rates from 2024 indexed to reflect price (CPI) growth.

2.7.3 Tax amounts

UK income tax is levied on taxable income over applicable allowances via a standard multi-step progressive rate schedule. The main tax thresholds and rates for selected years are reported in Table 2.40.

Table 2.40 Income Tax Rates and Thresholds

	2020	2021	2022	2023	2024	2025	2026
starting rate for savings threshold	5000	5000	5000	5000	5270	5300	5300
Scotland							
starter rate	19	19	19	19	19	19	19
basic rate threshold	2097	2097	2162	2162	2279	2292	2292
basic rate	20	20	20	20	20	20	20
intermediate rate threshold	12726	12726	13118	13118	13828	13907	13909
intermediate rate	21	21	21	21	21	21	21
higher rate threshold	31092	31092	31092	31092	32775	32961	32967
higher rate	41	41	41	42	42	42	42

[20] UKMOD assumes that the MCA is claimed by the husband in all cases.

additional rate threshold	150000	150000	150000	125140	125140	125140	125140
additional rate	46	46	46	47	47	47	47
Rest of UK							
basic rate	20	20	20	20	20	20	20
higher rate threshold	37700	37700	37700	37700	37700	37700	37700
higher rate	40	40	40	40	40	40	40
additional rate threshold	150000	150000	150000	125140	125140	125140	125140
additional rate	45	45	45	45	45	45	45

Source: Rates to 2023 set by legislation. Rates from 2024 assumed frozen, except for the basic to hither rate thresholds applied in Scotland which are indexed to price (CPI) growth.

The starting rate for savings threshold applies only to income from investments (*yiytx*). Before 2015, the savings rate threshold would only apply if non-investment income was less than the savings rate threshold. In that case, the tax system treated income from savings as the “top slice” of income and applied the starting rate of 10% to savings income earned up to the difference between the savings income threshold and non-savings income. From 2015 the saving rate of 10% has been abolished and the threshold increased, so that income from investments lower than the savings threshold is free of tax, while any excess over the threshold is taxed together with the remaining taxable income.

In 2016 the taxation of non-savings non-dividends (NSND) income was devolved to the Scottish government. Differences with the rest of the UK were implemented in Scotland from 2018/19, when two additional tax bands were introduced alongside changes in imposed tax rates. Although NSND income taxes were also partly devolved to the Welsh government in 2019, no differences have yet to emerge with the rest of the UK.

Model note: Total taxes for the whole UK are stored in the variable *tin_s*. This variable is the sum of variables storing the income taxes for Scotland (*tin12_s*), Wales (*tin11_s*) and the rest of the UK (*tin00_s*).

2.8 Additional policy systems in UKMOD

The latest version of UKMOD includes policy systems up to 2026. The systems for 2024 to 2026 are based on pre-announced changes to policy, statutory indexation rules, and assumptions concerning indexing more generally. Forward projections for index rates are derived from publications by the Office for Budgetary Responsibility and are included in the set of model parameters; see Annex 6.2 for related details.

3 DATA

3.1 General description

The UK database is drawn from the Family Resources Survey (FRS). Specifically, for this year there is a new UKMOD input dataset generated from FRS 2020/21.[21] This is a cross-sectional household survey based on a two-stage stratified clustered probability sample of private households and collected throughout the fiscal year (April-March). It was launched in 1992 to meet the information requirements of the Department for Work and Pensions. In Great Britain the sampling frame for the FRS is the Royal Mail Small Users Postcode Address File (PAF), listing

[21] See https://www.gov.uk/government/statistics/family-resources-survey-financial-year-2020-to-2021/family-resources-survey-financial-year-2020-to-2021.

addresses receiving less than 50 items of mail a day (intended to exclude business or other non-private residential addresses). Postcode sectors are drawn with probability proportional to size and subsequently stratified according to Government Office Regions, proportion of heads of households in particular socio-economic groups, economic activity rate and male unemployment rate as derived from the 2011 Census of Population. In a second stage a random sample of 27 addresses is drawn within each Primary Sampling Unit (PSU) and represents an interviewer's monthly assignment.

The Northern Ireland 2020/21 sample frame is the Land & Property Services' list of domestic properties (Pointer) and follows an unclustered, geographically stratified design. The sample covers only households living at private residential addresses. The main exclusions consist of people living in student accommodation, the homeless, those in nursing homes, hospitals or other types of residential care, prisoners and people living in military or police institutions.[22] This sample limitation means that taxes and benefits and other income components are under-represented for Northern Ireland to the extent that they are received (or paid) by people living in institutions.

Fieldwork is carried out by two organisations continuously from April to March of the following year in such a way that each quarter sub-sample is nationally representative. Interviewers are instructed to choose up to three households at multi household addresses and in 2019/20 interviewers averaged six calls per address before declaring an address a non-contact. A few days before the beginning of the fieldwork, an advance letter is posted to selected addresses providing information about the purpose of the survey. Non-response questionnaires collecting information about non-responding households are completed by interviewers. The face-to-face interview lasts on average 65 minutes per household and involves all adult individuals (aged 16 years old or more, excluding unmarried people 16 to 18 years old who are full-time students in non-advanced education). It is carried out using the Computer Assisted Personal Interviewing (CAPI) mode, and makes use of built-in consistency checks. Respondents are also encouraged to consult documentation when asked about reporting monetary amounts. After the interview, additional survey leaflets are left with the household, informing about the prospective use of data collected, the relevance of survey response and confidentiality issues.

In 2020/21 the data collection was impacted by COVID-19. In March 2020, the introduction of Government restrictions led to a compulsory halt to face-to-face interviewing in the home. This meant that from April 2020, and for the whole of the 2020 to 2021 survey year, data collection was by telephone instead of face-to-face. This shift in mode of interview has been accompanied by a substantial reduction in the number of interviews achieved: just over 10,000 interviews were achieved this year, compared with 19,000 to 20,000 in a typical FRS year.

Several adjustment procedures take place after the data collection, including taking into account interviewers' notes, checking fixed-amount benefits, disentangling multiple benefit receipts, investigating outliers and zero amounts. Item non–response mostly relates to self-employment and investment income and is limited to 0.5% of all responses. The UKMOD database makes use of the imputed data.

Table 3.1 UKMOD databases description

UKMOD database	**UK_2020_a1**
Original name	Family Resources Survey
Provider	Department for Work and Pensions

[22] For a quantitative assessment of the non-household population see 'Out for the count: the incomes of the non-household population and the effect of their exclusion from national income profiles', Martin Evans, LSE Welfare State Programme WSP/111, 1995.

Year of collection	2020/21
Period of collection	April 2019 – March 2020
Income reference period	Current year incomes
Sampling	Stratified clustered probability sample for Great Britain and unclustered, geographically stratified design for Northern Ireland
Coverage	Residents in private households
Effective sample	10,007 households
Response rate	23%

Source: DWP, Family Resources Survey 2020/21. See: https://www.gov.uk/government/statistics/family-resources-survey-financial-year-2020-to-2021/family-resources-survey-background-information-and-methodology.

3.1.1 Non-response

In 2020/21, 49% of the 39,216 sampled households provided full cooperation and proxy responses were obtained for 22% of adults.[23]

Table 3.2 Household response rates in the FRS 2020/21 by Government Office Regions

	Share of households
Region/Country	2020/21
United Kingdom	23
England	24
Wales	21
Scotland	20
Northern Ireland	18
North East	28
North West	23
Yorkshire and the Humber	27
East Midlands	27
West Midlands	22
East	26
London	17
South East	25
South West	28

Source: DWP, Family Resources Survey 2020/21 (Table M2. Methodology and standard error data tables. See: https://www.gov.uk/government/statistics/family-resources-survey-financial-year-2020-to-2021/family-resources-survey-financial-year-2020-to-2021/.

Lower response rates than the average were seen in households in London, West Midlands, Northern Ireland, Scotland and Wales (as shown in Table 3.2).

[23] Individual full cooperation requires less than 13 "don't know" or "refusal" answers to monetary amount questions out of approx. 50 questions. See: https://www.gov.uk/government/statistics/family-resources-survey-financial-year-2020-to-2021/family-resources-survey-financial-year-2020-to-2021. Sample quality and weights

3.1.2 Weights

The FRS data are provided with weights attempting to correct for differential non-response while scaling up sample numbers to the overall population. They are calculated as the ratio of population to sample counts for subgroups defined according to variables reflecting differential response rates. Population control totals are derived from external data sources and are adjusted to exclude people non-resident in private households.

Control totals for Great Britain are based on population totals by sex and age groups in each Government Office Region (ONS and General Register Office for Scotland); number of families with children in Scotland, England and Wales (DWP Child Benefit data); number of male and female lone parents in Great Britain (DWP estimates); households tenure type (ODPM[24], Scottish Executive, National Assembly for Wales) and Council Tax band (Valuation Office; Scottish Executive; except for Northern Ireland). Control totals for Northern Ireland include population totals by sex and age group (NISRA[25]), number of lone parents and households (Northern Ireland Department for Social Development estimates).[26]

In 2020/21 the grossing regime has been adapted to try to control for the larger impacts of the COVID-19 pandemic upon the achieved sample. Whilst the existing FRS grossing regime brought estimates close to the age and tenure profile of the UK population, it retained a disproportionate number of respondents who had been educated to at least degree level. It was important to adjust for this bias because income levels are strongly correlated with the level of education achieved. Therefore, additional grossing controls were introduced to rebalance the educational levels of those in the sample. The grossing regime has also been adapted to control for the differential level of response through the year. There were fewer responses in the early months of the survey year than in later months. This is not normally a feature of the FRS achieved sample, with response normally spread relatively equally over each twelve-month run of fieldwork. There has, however, been no change to the overall population basis for the estimates.

Table 3.3 Descriptive Statistics of the Grossing-up weight (*dwt*)

	UK_2020_a1
Number	21,254
Mean	3,105.511
SD	2,830.275
Maximum	35,963
Minimum	311
Max/Min	115.6

For 2020/21, no households have been dropped from the sample. For 2020/21 sample size is 21,254 individuals and 10,007 households. Applying weights included in the dataset to gross the numbers up to population figures gives 66,004,521 individuals and 28,206,330 households.

[24] Then, the Office of the Deputy Prime Minister.
[25] Northern Ireland Statistics and Research Agency.
[26] For more detail about the extent of imputation and control totals variables used to generate grossing factors, see DWP, Family Resources Survey 2020/21. See: https://www.gov.uk/government/statistics/family-resources-survey-financial-year-2020-to-2021/family-resources-survey-background-information-and-methodology .

3.2 Imputations and assumptions

The FRS data are obtained from the UK Data Archive at the University of Essex.[27] Adjustments to variables are kept to a minimum.

It should be noted that in the 2020/21 FRS data:

- Age is top-coded at 80.

Key variables that are imputed are:

- Mortgage interest is imputed for cases where a single repayment amount includes both interest and capital repayment;
- Rent is calculated to be gross (in some cases housing benefit has been deducted);
- The regime under which individuals pay National Insurance contributions (Not contracted out or contracted out) is imputed from information on (imputed) gross earnings and the contribution payment.

Council Tax: variables "tmu01" and "tmu02".

Because only about 20% of households (i.e. those paying it yearly) report the amount of Council Tax (after discounts, but gross of Council Tax Reduction), it needs to be imputed. Households are assigned to mutually exclusive strata defined according to Council Tax band, Government Office Region, and separately for single person households. The average Council Tax for each stratum is calculated based on non-missing observations, and then such sample average is imputed to the missing ones (more precisely, the variable *tmu01* is derived when stratum average is imputed to all households; the variable *tmu02* is derived when the stratum average is imputed to missing households only). By default, *tmu02* is used in the model. This variable is net of CT reduction; therefore it is grossed up with the observed CT reduction *bmu* in the model.

The input database contains also a variable for Council Tax band (*amriv00*).

Carer for means-tested benefits premium purposes: "lcr01"

Individuals providing care for at least 35 hours a week[28] can qualify for IS if the following applies to them: (a) they receive Carer's Allowance (CA) or (b) the person they care for has claimed or already receives Attendance Allowance (AA) or the higher or middle rate care component of Disability Living Allowance (DLA), either rate of the daily living component of Personal Independence Payment (PIP).

In the FRS we distinguish two cases: care provided within the household for which we can control for the conditions described above; care provided outside the household, for which we do not observe whether care recipients receive AA, DLA or PIP. For this second case we create a binary variable *lrc01*, which takes value 1 for somebody who (a) receives ICA (in this case should implicitly be providing more than 35 hours per week); or provides care to somebody inside the household receiving AA/DLA(care) at the middle rate or above or PIP: or (b) provides care to somebody outside the household for more than 35 hours per week.

In UKMOD this variable is used to distinguish IS from ib-JSA.

[27] Data from the Family Resources Survey are Crown Copyright. They have been made available by the Office for National Statistics (ONS) through the Data Service and are used by permission. Neither the ONS nor the Data Service bear any responsibility for the analysis or interpretation of the data reported here.

[28] To qualify for IS, if somebody does not receive CA, the decision maker may consider the quality and quantity of care provided, and grant entitlement to IS on the basis of care provided even if the total number of hours is less than 35 per week.

Benefits

Consistency checks are carried out for most benefit variables; for example, checking the coherence between recipients' age and benefit rules (e.g. Pension Credit and Income Support); or reported receipt of mutually exclusive benefits (e.g. Attendance Allowance, Disability Living Allowance and Personal Independence Payment); also, where reported amounts were higher than the maximum benefit rates, amounts were reset to such maximum value (e.g. Incapacity Benefit, Carer's Allowance, etc.).

Earnings and hours of work

Earnings information refers to employment income (*yem*) based on current employment, self-employment income (*yse*) estimated from information from survey questions on accounts and income drawn from own business, and earnings from odd jobs (*yot01*). Hours of work in employment and self-employment are stored in variables *lhw00* and, *lhw01*, respectively. Total number of hours, *lhw*, equals *lhw00+lhw01*.

Basic State Pension and Second State Pension

FRS data include a single variable covering all State Pension payments. As well as the basic State Pension, this includes payments from the Second State Pension (also known as the State Earnings Related Pension Scheme (SERPS)) and the graduated pension scheme that preceded it (under which some current pensioners receive relatively small payments). It also includes any increases due to deferred retirement. This single variable is split into two in the UKMOD database. One part is the basic State Pension (variable *boact00*). This is imputed by calculating what it would be for the person in question assuming they had made full contributions and, in the case of married women, also if they had made no contributions of their own. In the latter case a rough judgement is made about which situation applied in each case by comparing the two calculated values with the actual pension payment. Then, any excess is assumed to be the Second State Pension (*boactcm*). (Noteworthy, the underlying assumption here is that no one receives the new State Pension.) For tax-benefit calculations, the split matters only as far as uprating is concerned as the basic State Pension is uprated by the triple lock indexation (except in 2022 when it was a double lock) and the Second State Pension is assumed to be uprated by CPI (see section 3.2.4).

Increase to the State Pension age

From 6 April 2010, the age at which women become entitled to the State Pension and cease having to pay National Insurance contributions was rising by six months every year (hence, one year every two years) from its pre-2010 level of 60. This changes the composition of the sample of people who are of "working-age", which is clearly important when simulating how various fiscal systems will affect the working-age population. It also has implications for household incomes, as it affects receipt of several state benefits and liability to national insurance.

During the financial year 2020/21, the State Pension age (SPA) for men and women increased from 65 to 66 years in October 2020. Our base data (FRS 2020/21) includes 10 women and 4 men aged 65 receiving the State Pension, neither of whom would be entitled to it from 2021 onwards[29]. In previous versions of the UKMOD input data we corrected the data to allow for some mechanical response to the increases in the SPA for the affected people. Given the small number of affected individuals in 2020/21 sample, no additional correction was applied.

Transitions from Incapacity Benefit to Employment and Support Allowance

Incapacity Benefit (IB) has been unavailable to new claimants since October 2008, with adults who are unable to work through disability or ill-health having to claim employment support

[29] See Pension Act 2007 and 2011 for more details.

allowance (ESA) instead. In the previous versions of UKMOD input data we applied a correction to account for the transition from IB to ESA. This correction was no longer needed in 2020/21 dataset because there were no observations still receiving IB (bdict01=0).

3.2.1 Time period[30]

Information on earnings refers to the last pay period. Similarly, information about pensions and benefits refers to receipts in the most recent relevant period (e.g. week, 4-week, month, etc.) before the interview. Self-employment income is based on the most recent period (usually 12 months) for which annual business accounts are prepared for the Inland Revenue for tax purposes; in some cases this may be several years prior to the interview. Investment income is based on the last 12-month receipt. All monetary amounts in the FRS are expressed in weekly terms. These are converted into monthly terms for the UKMOD database. In the UKMOD calculations it is implicitly assumed that income is received at the same rate throughout the year. However, it should be remembered that this may not be the case and in particular that Income Tax (based on annual income) simulations do not take account of changes that may happen during the year. On the other hand, it is generally the case that personal and household characteristics are consistent with the current incomes that are observed, since they apply to the same or very similar reference periods. For more information about the adjustment of FRS variables into the UKMOD database variables see the UK Data Requirements Document (DRD).

3.2.2 Gross incomes

Gross incomes are imputed using the simple formula:

Gross income = net income + tax + employee and self-employed National Insurance Contributions + other deductions

FRS data include variables on Income Tax, employee and self-employed National Insurance Contributions and other deductions from gross earnings. In general, net income and taxes paid are recorded separately. For the great majority of people, the quality of data on direct taxes is very good. People in receipt of regular income are taxed through a Pay-As-You-Earn system and most taxable sources of investment income are paid net of standard rate tax. The difficulty comes for those whose earnings are irregular, particularly the self-employed and, to a lesser extent, those moving in and out of employment during the year and higher rate taxpayers with significant income from investments. In these cases, the individuals may make lump sum tax payments or receive tax refunds. This information is collected in the FRS. However, these lump sums may not be contemporaneous with the reported income. Basing net income on the reported direct tax, including lump sum payments, can lead to a few households having disposable income very much out of line with their expenditure. In future a more elaborate procedure for imputing gross income from net will be considered for these individuals.

3.2.3 Correcting for non-take-up

As will be clear from the report on validation exercises in the next section, assuming that all means-tested benefits and tax credits are received by those calculated by UKMOD to be entitled would result in over-estimates of most of these instruments and an under-estimate of poverty and inequality. To adjust for this, we employ a simple take-up correction based on the take-up proportions estimated on a caseload basis by the Department of Work and Pensions (DWP, 2020), HM Revenue & Customs (HMRC, 2019) and the Scottish Fiscal Commission (2021).[31] For

[30] For more information about the FRS variables as originally available see the FRS documentation available at: https://discover.ukdataservice.ac.uk/Catalogue/?sn=8013& type=Data%20catalogue

[31] Where ranges of take-up proportions are published, the mid-point is used.

example, we assume that some 5% of lone parents do not receive the combination of Child Tax Credit and Working Tax Credit to which they are entitled, and that this proportion is higher in London (19% of all families with children). Of those entitled to Pension Credit, 32% do not take it up, with the proportion much higher (58%) if there is only entitlement to the Savings Credit component. Take-up probabilities are applied at the household level (so that people entitled to the same benefits within a household exhibit the same take-up behaviour), for each benefit separately. In general, we assume that take-up behaviour is not affected by changes in the size of benefit or tax credit entitlements. However, by applying differential take-up probabilities according to type of claimant, as summarised in Table 3.4, some of this effect is captured.

Table 3.4 Take-up probabilities

Benefit and tax credit claimant type	Probability of take-up
Housing benefit for pensioners (>60/65) if not receiving PC(GC)	0.86
Housing benefit for people of working age in work if not receiving IS	0.57
Housing benefit for people of working age without work if not receiving IS	0.96
Council tax reduction for owners if not receiving IS or PC	0.36
Council tax reduction for tenants if not receiving IS or PC(GC)	n/a
Council tax reduction for private tenants	0.77
Council tax reduction for social tenants	0.87
Pension credit (guarantee or guarantee + savings)	0.70
Pension credit (savings only)	0.42
Income support for people without children	0.89
Income support for people with children	0.92
Child tax credit* and working tax credit for lone parents (not London)	0.95
Child tax credit* and working tax credit for couples with children (not London)	0.73
Child tax credit* and working tax credit (all parents) in London	0.81
Child tax credit* and working tax credit (all parents) in Scotland	0.85
Child tax credit* and working tax credit (all parents) in Wales	0.87
Child tax credit* and working tax credit (all parents) in Northern Ireland	0.82
Child tax credit family element only	0.66
Working tax credit (no children)	0.32
Working tax credit (no children) – single	0.34
Working tax credit (no children) - couple	0.32
Scottish Child Payment – families with children under the age of 6	0.8
Scottish Child Payment – families with children aged 6-15 years	0.74 in 2023 and 0.75 in 2024 and 2025

Notes: * If parents are taking up IS, CTC is assumed to be taken up.
Sources: HMRC, 2019: https://www.gov.uk/government/statistics/child-tax-credit-and-universal-credit-claimants-statistics-related-to-the-policy-to-provide-support-for-a-maximum-of-2-children-april-2019
DWP, 2020: https://www.gov.uk/government/collections/income-related-benefits-estimates-of-take-up--2#latest-release
Scottish Fiscal Commission, 2021: https://www.fiscalcommission.scot/wp-content/uploads/2021/10/Scotlands-Economic-and-Fiscal-Forecasts-August-2021-Chapter-5-Social-Security-Supplementary-Tables-Revised-October-2021

The correction is switched on by default in the baseline. To switch the take-up corrections off throughout any UKMOD module, a user needs to apply the relevant switch (BTO) from the run window of EUROMOD. Take-up probabilities summarised in Table 3.4 are stored as single constant parameter (defined in *ConstDef_uk*) in the model and the specific take-up correction is computed in each relevant policy sheet at the end of the simulation. Users can change these probabilities by changing the correspondent constants or switch off the take-up correction for each benefit separately by switching off the relevant function in each policy sheet.

We now explain the specific formulas to calculate the probabilities involved. We explain it for the take-up adjustment process, but they are homologous for the transition to UC. We will refer to the temporary rates after assigning the simulated benefits first to those with them observed in the data as 'TU%_obs', and to the target probabilities simply as 'target'. Then, those eligible to a benefit and without the benefit observed in the data are (1 - TU%_obs) of the total of those eligible.

- If target>TU%_obs , we need a probability for the random process Pr such that we sample from (1 - TU%_obs) and match the target, i.e. target = TU%_obs + (1 - TU%_obs) * Pr. This means that this probability is Pr = (target - TU%_obs) / (1 - TU%_obs).
- If target<TU%_obs , we need a random process with a probability Pr such that we sample from TU%_obs and come back to the target, i.e. target = TU%_obs - TU%_obs * Pr. This means that this probability is Pr = 1 - target/TU%_obs.

3.2.4 Updating

Annex 1 reports information about the uprating indices used to update (or backdate) monetary variables from the mid-point of the data year (October 2020 for FRS 2020/21) to the mid-point of the policy years applying on 30 June (i.e. October 2022 to October 2026) (see also the *Uprating Indices* table accessible via tab "Country Tools" in the User Interface). No other updating adjustments are employed. Thus, the distributions of characteristics (such as employment status and demographic variables) as well as the distribution of each income source that is not simulated remain as they were in the original fiscal year.

For the simulation of 2023/24 policy year onwards, we uprate the financial values of income variables using the latest forecast of earnings and prices made by the Office for Budget Responsibility.[32]

3.3 Multi-year datasets

In addition to the standard UKMOD input data based on a single-year of FRS data, a multi-year UKMOD input dataset is made available to users: UK_2020_b1. The multi-year dataset is constructed by appending three consecutive UKMOD input data files (i.e. three FRS waves). The increased sample size allows increasing variability in the data especially when analysing subnational reforms affecting subgroups of the population (e.g. lone parents in Scotland and Wales). Household sample weights are divided by 3 (i.e. the number of appended waves) to make the sample representative of the UK population. The household-level variable *dpd* denotes the income data period and is used to uprate correctly the financial values of the income data to the policy year (this is done by Uprate parameter *DBYearVar* in policy *Uprate_uk*).

Table 3.5 UKMOD multi-year dataset description

	UK_2020_b1
Original name	Family Resources Survey

[32] The analysis was done in the 2nd semester of 2021, and so we use the OBR forecasts from October 2021.

Provider	Department for Work and Pensions
Year of collection	2018/19, 2019/20, 2020/21
Period of collection	April 2018 – March 2021
Income reference period	Current year incomes as indicated by variable *dpd*
Sample statistics:	
Number of individuals	129,248
dpd=2017	43,087
dpd=2018	43,314
dpd=2019	21,254
Number of households	107,655
Sample weights (dwt):	
Mean	610.2757
SD	550.5934
Maximum	16,884.67
Minimum	72.33334
Max/Min	233.4286
Population statistics:	
Number of individuals	65,699,226.6
Number of households	28,019,642.7

4 VALIDATION

4.1 Aggregate validation

UKMOD results are validated against external benchmarks. Statistics are reported for market incomes, non-simulated taxes and benefits described by the input dataset, and simulated taxes and benefits, with comparisons made against external official data. This section focusses on the main discrepancies identified between UKMOD results and external benchmarks, along with discussion of potential explanatory factors.

4.1.1 Components of disposable income

The definition of disposable income in UKMOD follows closely that reported by the Family Resources Survey (FRS). The principal distinction between the two is that the FRS sums components of income that are net of tax and social contributions, whereas UKMOD aggregates measures that are gross of taxes, and subtracts tax as a separate component. Components of net income described by the two data sources are reported in Table 4.1.

Total individual net income in FRS is reported as the sum of: net income from employment (NINEARNS), net earnings from self-employment (NINSEIN2), net investment income (NININV), income from State retirement pensions plus income support (INRPINC), net private pension income (NINPENINC), total income from disability benefits (INDISBEN[33]), total income from other benefits (INOTHBEN[34]), total amount of tax credits received (INTXCRED[35]), and "other" net income (NINRINC[36]).

Although disposable income reported by UKMOD is constructed using the same components of income as the FRS, UKMOD considers measures gross of tax and social contributions wherever possible. This difference in conceptual approach can generate some disparities in reported measures of net income by the two data sources. To understand why, note for example, that the FRS is designed to account for tax adjustments that occur at year-end. In contrast, UKMOD's focus on the weekly financial circumstances of individuals omits such transfers.

Table 4.1 Components of disposable income

	UKMOD	FRS
variable name(s)	ils_dispy	NINDINC + CHINCDV
Employee cash or near cash income	+	+

[33] Total income from disability benefits in FRS is the sum of the following benefits: DLAc, DLAm, War Disablement Pension, Severe Disability Allowance, Attendance Allowance, and Industrial Injury Disablement Benefit.
[34] Total income from other benefits in FRS includes income from Child Benefit, Widow's Pension/Bereavement Allowance, Widowed Mothers/Widowed Parents Allowance, War Widow's/Widower's Pension, Invalid Care Allowance, Jobseeker's Allowance, Incapacity Benefit, DWP third party payments - JSA, Maternity Allowance, NI or state benefit, Guardian's Allowance, Work-Search Premium, In-work credit, Return to work credit, Work-related activity premium, Maternity Grant from Social Fund, Funeral Grant from Social Fund, Community Care grant from Social Fund, Child Maintenance Bonus/Premium, Lone Parent Benefit run-on/Job Grant, Widow's Payment, Winter Fuel Payments, Social Fund Loan: Repayment from JSA and extended HB and/or CTR, Income Support, DWP third party payments - IS/PC and Social Fund Loan: Repayment from IS/PC. Amounts are also added for SAP, SMP, SPP, SSP and Housing/Council Tax reduction.
[35] Total amount of tax credits sums Working Tax Credit and Child Tax Credit.
[36] Remaining income includes income from Sub-Tenants, Odd-jobs, School Milk, School Meals, Healthy Start Scheme Private Benefits, New Deal/GTA, Student/School Grants, Royalties, Allowances from Friends, Relatives or an Organisation, and allowances from Local Authorities/SS for foster and adopted children (INRINC) minus amount of tax paid on the rent received from property.

Employer's social insurance contribution	0	0
Company car	0	0
Contributions to individual private pension plans	0	0
Cash benefits or losses from self-employment	+	+
Pension from individual private plans	+	+
Unemployment benefits	+	+
Old-age benefits	+	+
Survivor’s 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 property	-	-
Regular inter-household cash transfer paid	-	-
Tax on income and social contributions	-	-
Repayments/receipts for tax adjustment	0	+

4.1.2 Assumed sources of income

Earnings

Earnings is a key exogenous input of UKMOD. Table 4.2 compares aggregate earnings in UKMOD against estimates reported by the Office for National Statistics from the Annual Survey of Hours and Earnings (ASHE). ASHE is based on a 1% sample of employees on the Inland Revenue PAYE register for February and April, supplemented by data from the Inter Departmental Business Register for businesses registered for VAT but not registered for PAYE, to cover businesses which do not have employees above the PAYE threshold. Table 4.2 shows that average earnings across all employees assumed described by the UKMOD database is close (4% overestimated) to the corresponding average value described by ASHE in the baseline year. Variation is slightly higher for men (6%) and lower for women (0%).

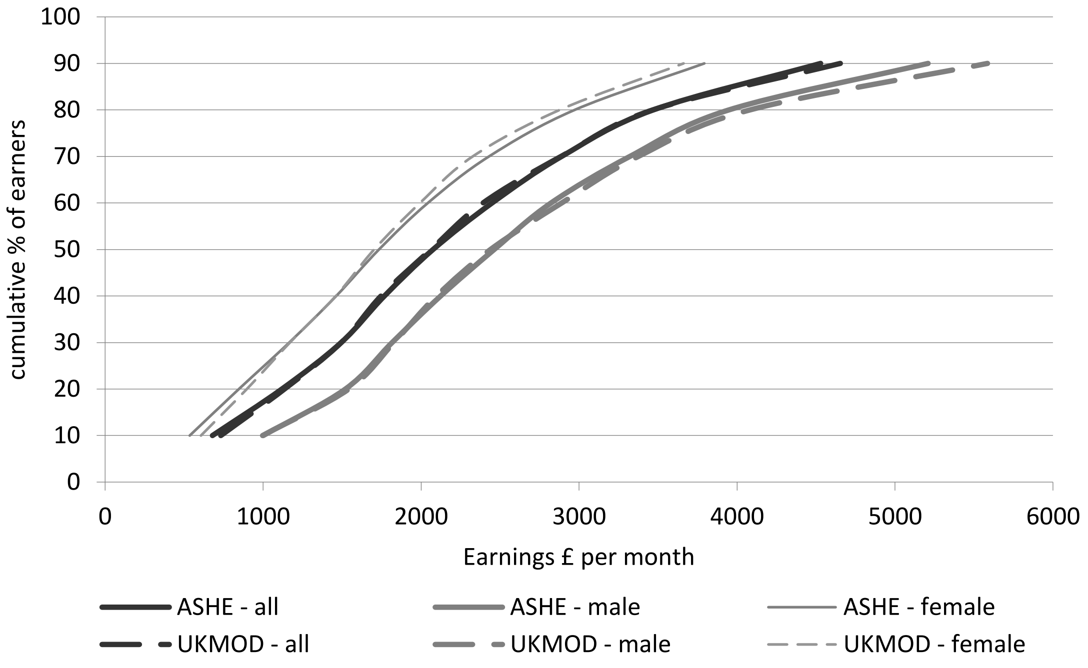
Table 4.2 Average gross monthly earnings from employment by population subgroup and data source

	UKMOD	ASHE	UKMOD/ASHE
all	2592	2495	1.04
male	3120	2939	1.06
female	2060	2055	1.00

Source: UKMOD and ASHE: Annual Survey of Hours and Earnings, reported by ONS Earnings and hours worked dataset: ASHE Table 1.1a
Notes: Data reported for 2020

Figure 4.1 compares the cumulative earnings distribution from ASHE and the UKMOD input data for all employees and for men and women (plotting decile points cumulatively).

Figure 4.1 Cumulative earnings distributions by data source



Source: UKMOD and ASHE: Annual Survey of Hours and Earnings, reported by ONS Earnings and hours worked dataset: ASHE Table 1.1a
Notes: Data reported for 2020

Benefits and taxes

Table 4.3 reports projected caseloads for benefits and taxes that are exogenously assumed by UKMOD with external sources, and Table 4.4 reports the same for aggregate expenditure. These statistics provide a margin for assessing the representativeness of the default databases assumed by UKMOD. The tables also provide some useful background information for the validation of simulated components of income which may depend on, or are associated with, non-simulated components.

Table 4.3 Assumed tax benefit instruments underlying UKMOD - caseloads (thousands of people)

tax-benefit programme	variable name(s)	UKMOD policy year							DWP estimates						
		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Contributory ESA	bdict02	377	377	291	291	291	291	291	384	401	416	432	438	442	446
Basic State Pension	boact00	11194	11151	11142	11142	11142	11142	11142	10700	10160	9583	9090	8602	8126	7660
Second State Pension	boactcm	8346	8346	8423	8423	8423	8423	8423	8858	8448	8015	7662	7299	6931	6570
Bereavement Benefits	bsuwd	186	186	169	169	169	169	169	100	98	88	79	75	71	69
Attendance Allowance	bdioa	813	813	813	813	813	813	813	1290	1280	1318	1360	1403	1444	1483
Disability Living Allowance	-	825	825	1151	1151	1151	1151	1151	1232	1206	1207	1200	1200	1187	1168
Severe Disablement Allowance	bdisv	9	9	15	15	15	15	15	15	13	12	10	9	8	6
Carer's Allowance	bcrdi	736	736	663	663	663	663	663	850	848	883	926	956	987	1050
Industrial Injuries Disablement Allowance	bdiwi	123	123	152	152	152	152	152	239	231	222	214	205	196	188
Maternity allowances	bmana	16	16	14	14	14	14	14	49	46	45	46	46	46	47
War Pension and allowances	boawr	81	81	58	58	58	58	58	-	-	-	-	-	-	-
Statutory Maternity Pay	bmaer	136	136	163	163	163	163	163	254	247	247	248	249	250	252
Personal Independence Payment	bdiscwa, bdimbwa	4013	4013	2827	2827	2827	2827	2827	2308	2501	2811	3128	3349	3596	3865
Council tax	tmu	27310	27310	26985	26985	26985	26985	26985	-	-	-	-	-	-	-

Source: UKMOD and Department for Work and Pensions, Autumn Statement 2022 Expenditure and Caseload forecasts, Table 1c

Notes: DWP caseload forecasts from 2022

Table 4.4 Assumed tax benefit instruments underlying UKMOD - expenditure (£millions)

tax-benefit programme	variable name(s)	UKMOD policy year							DWP estimates						
		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Contributory ESA	bdict02	2320	2332	1930	2126	2241	2253	2254	4567	4507	4539	4934	5062	4800	4595
Retirement Pension	boact00	72708	74323	76209	83920	89119	91350	93632	66642	64358	63413	67001	67587	65360	63370
Second State Pension	boactcm	18819	18912	18732	20622	21738	21861	21866	18227	17432	17325	19184	20038	19094	18163
Bereavement Benefits	bsuwd	1059	1065	908	1000	1054	1060	1060	498	389	476	407	354	326	306
Attendance Allowance	bdioa	3316	3333	3390	3734	3936	3958	3959	5338	5307	5626	6432	7063	7310	7512
Disability Living Allowance	-	3956	3976	5660	6232	6569	6607	6608	5813	5696	5925	6538	6969	6921	6834
Severe Disablement Allowance	bdisv	39	39	67	74	78	78	79	15	13	12	10	9	8	6
Carer's Allowance	bcrdi	2570	2583	2393	2635	2778	2794	2794	3039	3075	3309	3856	4201	4369	4651
Industrial Injuries Disablement Allowance	bdiwi	334	336	505	556	586	589	589	724	705	697	738	750	718	688
Maternity allowances	bmana	127	128	100	110	116	117	117	384	362	389	431	457	455	469
War Pension and allowances	boawr	494	496	295	325	343	344	345	-	-	-	-	-	-	-
Statutory Maternity Pay	bmaer	885	890	1276	1404	1480	1489	1489	2500	2606	2626	2817	2953	2981	3018
Personal Independence Payment	bdiscwa, bdimbwa	12768	12831	9368	10315	10873	10935	10936	13689	15041	17561	21677	24628	26505	28498
Council tax	tmu	43830	45653	46909	48932	51034	53189	55433	-	-	-	-	-	-	-

Source: UKMOD and Department for Work and Pensions, Autumn Statement 2022 Expenditure and Caseload forecasts, Table 1c

Notes: DWP forecasts from 2022

Table 4.3 indicates a close degree of correspondence between the relative orders of magnitude of the caseloads reported for alternative benefit schemes by FRS data (as considered by UKMOD) and DWP caseload figures. Nevertheless, inspection of the detail reported in the table indicates some notable variation between the two data sources.

The projected caseload numbers generated by UKMOD, as reported in Table 4.3, are generally the same for each policy year, except for discontinuous changes from 2021 to 2022.[37] This variation is due to the default survey data considered by UKMOD. As discussed in section 3, the most recent wave of the Family Resources Survey (FRS) available at the time of writing reports data collected during 2020/21. This sample period was affected by the COVID-19 pandemic, which had important influences on both labour market metrics and survey response rates. The default parameters of UKMOD consequently assume the 2020/21 FRS data for system years 2020 and 2021, and FRS data from 2019/20 for projections in system years from 2022.

Inspection of DWP forecasts from 2022 generally reveals smooth variation of caseload estimates with time for most of the benefits reported in Table 4.3. These disparities in data sources generate some notable differences in reported caseloads. In the case of contributions-based ESA, for example, DWP data reflect a clear upward trend in caseloads. The data derived from UKMOD fail to reflect this upward trend, in part due to the limited temporal variation of the survey data underlying the reported time horizon, and in part because data underlying projections for later years (2022 to 2026) were observed for an earlier period (2019/20 rather than 2020/21).

The most sizeable absolute differences between caseloads for 2020 underlying UKMOD, relative to DWP estimates, are for Personal Independence Payment (PIP), Disability Living Allowance (DLA) and Attendance Allowance (AA). Concerning the former two of these (PIP and DLA), it is notable that differences between UKMOD and DWP estimates decline substantially from 2022. This may indicate issues associated with survey response rates observed during the COVID-19 pandemic. Concerning Attendance Allowance, the data underlying UKMOD understate caseload projections by DWP by approximately 40% throughout the reported time horizon.

Proportionately, Table 4.3 indicates that some of the largest differences between caseloads reported by DWP and the data underlying UKMOD are for maternity related benefits. In the case of Maternity Allowance, the data underlying UKMOD indicate around one third of the caseload numbers reported by DWP, and for Statutory Maternity Pay between half and two thirds. These differences may also be interpreted as indicating deficiencies in the sample coverage of the FRS of new mothers.

Table 4.4 indicates that most of the disparities discussed above for caseload figures also apply to projections for benefit expenditures. This highlights the importance of benefit incidence on overall expenditure. However, substantial differences between the caseload and expenditure statistics are found for the Personal Independence Payment and Severe Disablement Allowance (SDA). In the case of PIP, a discontinuous drop in aggregate expenditure is reported for the data underlying UKMOD from 2021 to 2022, in common with the caseload data. But expenditure on PIP described by UKMOD data start lower than associated estimates reported by DWP, so that the drop from 2021 to 2022 exaggerates differences between the two series rather than compensating for them. The overall implication is that the average payment per PIP recipient described by the data underlying UKMOD substantially understates that implicit in the DWP estimates.

In contrast, the reverse is broadly true of data reported for SDA. Whereas caseload figures reported for SDA in data underlying UKMOD for 2020 substantially understate DWP estimates, aggregate expenditure figures in data underlying UKMOD substantially overstate estimates

[37] Caseloads for "Retirement Pension" also vary between 2020 and 2021, which vary due to assumed changes in State Pension age (section 1.1, paragraph c)

reported by DWP. As the year of analysis increases, so too does the excess expenditure on SDA described by data underlying UKMOD, relative to DWP estimates. In part this is because UKMOD caseloads increase from the 2021 (FRS data for 2020/21) to 2022 (FRS data for 2019/20) system years, and in part it is attributable to assumed price (CPI) indexation of SDA payment rates which do not appear to apply to DWP estimates.

4.1.3 Validation of simulated incomes

Table 4.5 reports the number of benefit recipients, taxpayers, and National Insurance payers alongside associated government statistics based on administrative data sources. The simulated data are designed to account for non-take-up of benefits, as discussed in section 3.2.3. Similarly, Table 4.6 displays simulated measures of aggregate annual expenditure, or revenue distinguished by transfer scheme alongside associated official statistics. The remainder of this section discusses projections for selected schemes in turn.

A quick review of the statistics reported in Table 4.5 and Table 4.6 reveals that orders-of-magnitude of aggregate summary statistics for taxes and benefits simulated by UKMOD match up to those evaluated from administrative data. More detailed observations for selected tax and benefit schemes are discussed below.

Table 4.5 Tax benefit instruments simulated by UKMOD - caseloads (thousands of people)

tax-benefit programme	variable name(s)	UKMOD policy year							Official estimates						
		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Best Start Grant and Foods	bmascmt01_s, bmascmt_s	32	16	63	73	79	78	76	77	57	46	-	-	-	-
Child Benefit (c)	bchkid_s	12226	12047	11368	11136	11074	11036	10928	12524	12309	-	-	-	-	-
Child Benefit	bch_s	6828	6720	6421	6280	6241	6217	6154	7211	7088	-	-	-	-	-
Child and Working Tax Credits	bfamt_s, bwkmt_s	1567	1060	814	658	380	0	0	2017	-	-	-	-	-	-
Council Tax Reduction (h)	bmu_s	5876	5759	5257	5301	5381	5424	5451	-	-	-	-	-	-	-
Employment and Support Allowance (ib)	bsadi_s	734	647	454	368	189	0	0	961	871	783	699	643	565	508
Free School Meals	bched01_s	2940	2905	2956	2978	3004	3038	3092	-	-	-	-	-	-	-
Healthy Start (food)	bmamt01_s	444	429	337	340	357	350	348	-	-	-	-	-	-	-
Housing Benefit (h)	bho_s	2478	2185	2068	1873	1561	1192	1183	3028	2738	2499	2325	2158	1743	1299
Income Support*	bsa_s	890	752	609	482	258	0	0	369	276	201	147	107	45	3
Jobseeker's Allowance (cb)	bunct_s	63	63	25	25	25	25	25	156	48	21	17	19	19	17
Pension Credit	boamt_s	1379	1252	1357	1354	1354	1357	1366	1480	1410	1373	1354	1288	1226	1165

Notes: Table continued next page

Table 4.5 Tax benefit instruments simulated by UKMOD - caseloads (thousands of people, continued)

tax-benefit programme	variable name(s)	UKMOD policy year							Official estimates						
		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
School Clothing Grant	bched02_s	1200	1162	1029	1063	1105	1139	1126	-	-	-	-	-	-	-
Scottish Carer's Allowance Supplement (i)	bcrdicm_s	44	44	52	52	52	52	52	85	86	85	-	-	-	-
Scottish Child Payment (c)	bchmt_s	-	35	170	181	189	193	189	-	93	146	-	-	-	-
Scottish Child Winter Heating Assistance (c)	bchht_s	-	5	3	3	3	3	3	-	20	-	-	-	-	-
Sure Start Maternity Grant	bmamt_s	37	33	72	77	83	85	84	-	-	-	-	-	-	-
Universal Credit	bsauc_s	4038	4437	4337	4855	5746	6572	6508	4011	4111	4279	4730	5292	5804	6142
Winter Fuel Allowance (h)	boaht_s	11998	11435	11239	11239	11239	11239	11239	11142	11256	11503	11694	11899	12109	12160
Benefit cap (Housing Benefit)	brd_s	47	47	36	22	14	2	2	26	19	12	-	-	-	-
Benefit cap (Universal Credit)	brduc_s	169	166	85	77	98	108	102	142	160	111	-	-	-	-
income taxes and social contributions															
Income tax (i)	tin_s	28797	29579	31467	32495	32902	33134	33396	32200	32700	34000	-	-	-	-
Basic rate (i)	-	22815	23039	23776	24076	24285	24296	24326	27000	26600	27200	-	-	-	-
Higher rate (i)	-	3652	4110	5160	5457	5562	5740	5942	4140	4760	5510	-	-	-	-
Additional rate (i)	-	219	273	425	816	831	859	892	457	563	629	-	-	-	-
NIC Employees (i)	tscee_s	22074	22960	23024	22953	22987	23088	23195	-	-	-	-	-	-	-
NIC Self employed (i)	tscse_s	1194	2271	2613	2601	2613	2696	2721	-	-	-	-	-	-	-
NIC Employers (i)	tscer_s	22504	23266	24183	24380	24442	24490	24534	-	-	-	-	-	-	-

Source: UKMOD and Department for Work and Pensions, Autumn Statement 2022 Expenditure and Caseload forecasts, Table 1c, and Scottish Government statistics (https://www.gov.scot/collections/social-security-scotland-stats-publications)
*Notes: DWP forecasts from 2022. Caseloads refer to numbers of families, except: (c) children, (h) households, (i) individuals. *: Income Support includes income-based Jobseeker's Allowance. (cb) denotes 'contributions-based', and (ib) denotes 'income based'.*

Table 4.6 Tax benefit instruments simulated by UKMOD - expenditure (£millions)

tax-benefit programme	variable name(s)	UKMOD policy year							Official estimates						
		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Best Start Grant and Foods	bmascmt01_s, bmascmt_s	12	6	28	41	45	42	42	29	28	21	-	-	-	-
Child Benefit	bch_s	11098	10899	10588	11357	11898	11874	11742	11115	11046	11191	12162	12584	12493	12362
Child and Working Tax Credits	bfamt_s, bwkmt_s	8643	5767	4703	4034	2343	0	0	14568	10392	8354	6946	3927	1420	237
Council Tax Reduction	bmu_s	7558	7707	7503	7867	8252	8600	8949	-	-	-	-	-	-	-
Employment and Support Allowance (ib)	bsadi_s	5305	4579	3330	2958	1672	0	0	8860	8007	7508	7937	7902	7813	7553
Free School Meals	bched01_s	3968	3909	4087	4501	4757	4878	4968	-	-	-	-	-	-	-
Healthy Start (food)	bmamt01_s	126	167	133	134	140	136	136	-	-	-	-	-	-	-
Housing Benefit	bho_s	11004	10127	9712	8969	7409	5471	5431	17334	16126	14777	14276	14161	12401	10798
Income Support*	bsa_s	3411	2873	2452	2170	1268	0	0	1516	1068	817	727	563	235	17
Jobseeker's Allowance (cb)	bunct_s	233	234	99	109	115	116	116	611	190	91	72	84	81	78
Pension Credit	boamt_s	4370	3831	4355	4768	5043	5124	5258	5071	4834	4905	5377	5283	5102	4914
School Clothing Grant	bched02_s	284	275	248	279	303	320	316	-	-	-	-	-	-	-

Notes: Table continued next page

Table 4.6 Tax benefit instruments simulated by UKMOD - expenditure (£millions, continued)

tax-benefit programme	variable name(s)	UKMOD policy year							Official estimates						
		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Scottish Carer's Allowance Supplement	bcrdicm_s	30	31	25	28	29	30	30	58	59	42	-	-	-	-
Scottish Child Payment	bchmt_s	0	24	210	399	435	446	434	4	55	96	-	-	-	-
Scottish Child Winter Heating Assistance	bchht_s	0	1	1	1	1	1	1	4	4	-	-	-	-	-
Sure Start Maternity Grant	bmamt_s	18	17	37	40	43	44	43	28	26	25	28	28	29	28
Universal Credit	bsauc_s	38122	39612	37137	43736	53918	61863	61072	38320	41057	42709	49883	60495	66408	69530
Winter Fuel Allowance	boaht_s	1990	1916	1903	1903	1903	1903	1903	1958	1971	2002	2038	2079	2120	2139
Benefit cap (Housing Benefit)	brd_s	190	308	116	95	46	1	1	-	-	-	-	-	-	-
Benefit cap (Universal Credit)	brduc_s	687	646	260	230	337	362	319	-	-	-	-	-	-	-
income taxes and social contributions															
Income tax	tin_s	149405	164580	205344	235819	240776	246492	254345	201287	227775	251032	-	-	-	-
Basic rate	-	60906	63871	68330	71151	71947	72366	73341	98949	103383	112192	-	-	-	-
Higher rate	-	61991	69490	89864	88729	90784	93507	97261	59358	72524	81820	-	-	-	-
Additional rate	-	21054	25370	39717	65776	67352	69688	72670	42980	51868	57020	-	-	-	-
NIC Employees	tscee_s	55301	60554	65668	61679	62486	63547	64992	56763	59674	-	-	-	-	-
NIC Self-employed	tscse_s	3773	4152	5887	5493	5591	5698	5827	3667	3942	-	-	-	-	-
NIC Employers	tscer_s	78664	86786	103914	103760	105282	107312	110101	84034	90728	-	-	-	-	-

Source: UKMOD and Department for Work and Pensions, Autumn Statement 2022 Expenditure and Caseload forecasts, Table 1c, and Scottish Government statistics (https://www.gov.scot/collections/social-security-scotland-stats-publications)
*Notes: DWP forecasts from 2022. (ib) denotes income-based' and (cb) denotes 'contribution-based'. *: Income Support includes income-based Jobseeker's Allowance.*

Child Benefit

UKMOD produces estimates very close to the administrative figures for Child Benefit, with respect to the number of families and children in receipt of the benefit and overall benefit expenditure. This reflects the relatively simple rules governing Child Benefit, and the targeting of weights in the Family Resources Survey to match population aggregates.

Child Tax Credit and Working Tax Credit

Both the incidence and expenditure on tax credits tend to understate administrative data by an appreciable margin. In part, this can be attributed to disparities between the survey data considered as input for UKMOD, which also understates estimates based on administrative data.[38]

One reason for the mismatch between UKMOD and administrative data concerning tax credits is that tax credit payment rates in practice are based on income earned in the preceding year. In absence of survey data concerning previous year income, UKMOD evaluates tax credits based on current reported income. Furthermore, administrative statistics describe 'finalised awards' for tax credits. Finalised awards include year-end adjustments that account for within-year fluctuations of income, which UKMOD is ill-equipped to reflect.

The simulated incidence of tax credits also reflects model assumptions governing the receipt of tax credits versus Universal Credit. While the importance of this consideration is mitigated by the close reflection obtained by UKMOD for the incidence of Universal Credit (discussed below), it is not ruled out due to the diverse benefits that Universal Credit will replace. For example, incidence statistics for Income Support described by administrative data are overstated by UKMOD simulations, potentially off-setting associated effects of tax credits on projections for Universal Credit.

Finally, it is worth bearing in mind that the under-projections by UKMOD for tax credits may indicate that the survey data considered for the model under-represent the target population for tax credits.

Housing Benefit

Housing Benefit recipients projected by UKMOD understate statistics based on administrative data. This may be due to poor approximation of rents in UKMOD, which is an issue that the model team will work on during the coming year. Nevertheless, accurate projection of Housing Benefit is complicated by the diverse benefits that are taken into consideration by the associated means-test, and the on-going transition to Universal Credit.

Income Support and income-based Employment and Support Allowance

UKMOD simulates Income Support and income-based Jobseeker's Allowance together. Table 4.5 and Table 4.6 indicate that UKMOD overstates the incidence of Income Support (and income-based Jobseeker's Allowance) relative to administrative data for 2020.

This can be attributed, in part, to difficulties associated with distinguishing eligibility for Income Support (IS) and income-based Employment and Support Allowance (ib-ESA) by the model. Specifically, receipt of IS or ib-ESA depends upon an individual's capacity for work (see section 2.5). UKMOD imputes capacity for work based on other benefits that an individual is reported to receive. The statistics reported in Table 4.5 and Table 4.6 suggest that UKMOD under-identifies limited capacity for work, resulting in over-identification of IS and under-identification of ib-ESA. Aggregating the caseloads reported for IS and ib-ESA in Table 4.5 indicates that UKMOD

[38] The Family Resources Survey for 2020, for example, reports aggregate receipt of tax credits worth £10.5 billion, understating the official estimate by £4.0 billion.

marginally overstates the incidence of the two benefits, relative to administrative data. Doing the same for the expenditure figures reported in Table 4.6 indicates that UKMOD understates expenditure on the two benefits, relative to administrative data. This last finding is consistent with the more generous benefits payable under ib-ESA, relative to IS.

Pension Credit

The incidence of Pension Credit simulated by UKMOD generally matches up closely with official data sources, both with respect to caseloads (Table 4.5) and overall benefit expenditure (Table 4.6).

Universal Credit

Universal Credit has been gradually replacing legacy benefits since its introduction in 2013. Although initial plans were that the transfer to Universal Credit would be complete by the end of 2018, the process has been subject to repeated delays, complicating the forward projections. Bearing in mind these challenges, UKMOD projections for Universal Credit are generally found to match up closely with official data, as reported in Table 4.5 and Table 4.6.

Winter Fuel Allowance

UKMOD projections for Winter Fuel Allowance are found to closely reflect associated official data. The most conspicuous departure between the two data sources is that forward projections by UKMOD fail to capture the trend increase in caseloads described by Department for Work and Pensions forecasts. This disparity can be attributed to the static nature of the survey data underlying UKMOD forward projections.

Benefit cap

From April 2013 a benefit cap was introduced to reduce the maximum income from benefits received by a benefit unit. A benefit unit whose entitlement exceeds the benefit cap limit has the amount of HB or UC (whichever it receives) reduced to match the benefit cap limit. The benefit cap was fully functional from September 2013.[39] In 2020, the number of benefit units projected to be affected by the benefits cap are slightly over-projected by UKMOD, relative to administrative statistics.

Income Tax

UKMOD projections understate official statistics for 2020 regarding both the numbers of taxpayers and the total revenue returned to the Exchequer. It is of note that the scales of these disparities are larger in 2020 and 2021 than 2022, which may be attributable to poor survey response rates observed during the COVID-19 pandemic. This is a key consideration underlying the decision to define 2019 survey data as the default option for system years from 2022.

Nevertheless, as reported in past Country Reports, UKMOD is typically found to understate official aggregates for income taxes. The most likely explanation is that there is some under-reporting of high incomes and under-representation in the FRS of high-income earners. This proposition is supported by the observation that the most severe under-projections of official aggregates are found for additional rate taxpayers. The UKMOD development team are currently exploring use of the Households Below Average Income dataset to address this issue.

[39] The first external statistics on the numbers of households affected can be found here https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/542734/benefit-cap-statistics-to-may-2016.pdf

National Insurance contributions

Table 4.6 indicates that UKMOD closely captures official revenue statistics for National Insurance contributions. This is particularly true for employees and the self-employed, with some evidence of UKMOD simulations under-projecting contributions by employers.

4.2 Income distribution

The distributional analysis reported in this section follows *Household Below Average Incomes* methodology.[40] Analysis focuses on measures of household (before housing costs) income, equivalised using the "modified OECD scale".[41] The unit of analysis is the individual, on the assumption that all household members share household equivalised income equally.

4.2.1 Income inequality

Table 4.7 reports distributional statistics for equivalized disposable household incomes generated by UKMOD alongside associated statistics evaluated from (un-simulated) Family Resources Survey (FRS) data and reported by the Department for Work and Pensions publication *Households Below Average Income* (HBAI).

A quick review of Table 4.7 indicates a close degree of correspondence between the distribution of incomes projected using UKMOD and both the FRS and HBAI. A closer inspection of the statistics, however, reveals some interesting variation.

The Gini coefficient and median of incomes simulated by UKMOD for 2020 closely reflect the same statistics reported by the HBAI, with both data sources overstating the Gini evaluated from FRS data and understate FRS median incomes. In contrast the mean of simulated incomes generated by UKMOD understates both the FRS and HBAI, suggesting that UKMOD fails to reflect variation reported by the alternative data sources toward the top of the income distribution. This conclusion is consistent with disparities reported between UKMOD and official statistics in relation to income taxes (see section 4.1.3).

The quintile median incomes reported in Table 4.7 suggest a close correspondence between the distributions of income projected by UKMOD for 2020 and HBAI statistics, with the FRS describing higher incomes throughout the distribution. The 2020/21 HBAI does not report quintile shares, due to survey problems associated with the COVID-19 pandemic. All of the quintile shares evaluated on UKMOD simulated data are within one percentage point of those derived from the FRS.

[40] See the most recent edition of *HBAI Quality and Methodology* publication by the Department for Work and Pensions.
[41] Scale allocates a value of 0.66 to the first adult household member, 0.34 for each additional member aged 14 or above and 0.2 for each child aged under 14.

Table 4.7 Distributions of household equivalised disposable incomes (current prices)

	UKMOD policy year							FRS	HBAI
	2020	2021	2022	2023	2024	2025	2026	2020	2020
Gini	36	35	30	30	30	30	30	31	34
Mean (£ per month)	2569	2707	3161	3416	3449	3485	3528	2869	2844
Median (£ per month)	2295	2393	2726	2902	2938	2969	3002	2434	2337
Quintile medians (£ per month)									
lowest	1131	1191	1442	1576	1587	1606	1615	1269	1190
2	1791	1843	2079	2229	2253	2278	2294	1863	1771
3	2295	2395	2727	2902	2938	2969	3003	2435	2337
4	3010	3154	3567	3803	3845	3885	3936	3235	3070
highest	4524	4733	5233	5666	5722	5774	5862	4939	4593
Quintile shares (%)									
lowest	4	5	9	9	9	9	9	8	na
2	14	14	13	13	13	13	13	13	na
3	18	18	17	17	17	17	17	17	na
4	24	23	23	22	22	22	22	23	na
highest	40	40	38	39	39	39	39	39	na

Source: UKMOD and Household Below Average Income, 2020/21, Summary tables, Table 1.2b.

Notes: Statistics evaluated for household equivalised before housing costs disposable income. The unit of analysis is the individual. Incomes adjusted using the modified OECD scale with adult couples assumed as the reference unit (scales equal to 1).

4.2.2 Poverty rates

Table 4.8 displays poverty rates described by data generated by UKMOD alongside associated statistics evaluated from (un-simulated) Family Resources Survey (FRS) data and reported by the Department for Work and Pensions publication *Households Below Average Income* (HBAI). Comparing the three alternative series reported for 2020 generally indicates a close correspondence between the alternative data sources.

The most substantial differences between the alternative series reported in Table 4.8 are found for UKMOD poverty rates among children and pensioners, which both understate associated statistics reported by the HBAI. Regarding pensioners, poverty rates projected by UKMOD are almost identical to those calculated from FRS data. This finding suggests that disparities between poverty rates simulated for pensioners by UKMOD and the HBAI can primarily be attributed to the model's input data. Similarly, poverty rates evaluated for children from FRS data also understate the HBAI, so that the input data for UKMOD can also be taken to partly explain the associated gap with HBAI data. Nevertheless, poverty rates for children evaluated from FRS data understate the HBAI by an appreciably smaller margin than do the simulated data from UKMOD, indicating that something more is at work. One of the most obvious possibilities is that assumed take-up rates for child related benefits in UKMOD may be higher than implied by HBAI data.

Table 4.8 Poverty rates by age and gender (population percentages unless otherwise stated)

	UKMOD policy year							FRS	HBAI
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2020**	**2020**
Median (£ per month)	2295	2393	2726	2902	2938	2969	3002	2434	2337
Full population									
below 50% of median	10.0	10.0	8.0	7.0	8.0	8.0	8.0	9.0	9.4
below 60% of median	16.0	16.0	15.0	14.0	14.0	14.0	15.0	15.0	15.8
below 70% of median	23.0	24.0	24.0	23.0	23.0	24.0	24.0	24.0	24.2
Children									
below 50% of median	10.0	10.0	9.0	8.0	9.0	8.0	9.0	11.0	10.7
below 60% of median	16.0	19.0	19.0	18.0	18.0	18.0	19.0	18.0	19.5
below 70% of median	27.0	28.0	32.0	31.0	31.0	31.0	32.0	29.0	30.8
Over State Pension age									
below 50% of median	6.0	8.0	9.0	6.0	8.0	7.0	7.0	6.0	8.4
below 60% of median	14.0	15.0	19.0	16.0	16.0	16.0	15.0	14.0	16.4
below 70% of median	23.0	25.0	31.0	27.0	28.0	27.0	27.0	24.0	25.8
Gender, under 60% of median									
men	16.0	16.0	14.0	14.0	14.0	14.0	14.0	15.0	na
women	16.0	17.0	16.0	15.0	15.0	15.0	15.0	16.0	na

Source: UKMOD and Household Below Average Income, 2020/21, Data tables, Tables 3.1ts, 3.10ts, 4.1tr, and 6.1tr.

Notes: Statistics evaluated for household equivalised before housing costs disposable income. The unit of analysis is the individual. Incomes adjusted using the modified OECD scale with adult couples assumed as the reference unit (scales equal to 1).

4.3 Summary of “health warnings”

This section summarises key findings of the validation exercise reported above and discusses other issues that are useful to bear in mind when interpreting data generated using UKMOD.

Several results reported in this section allude to the possibility that the UKMOD input data may not account sufficiently for high income individuals. For example, total income tax revenue generated for 2020 understates statistics derived from administrative data, as do projected child poverty rates. Furthermore, UKMOD simulates less Housing Benefit than described by administrative data, possibly due to poor approximations for rents in the considered survey data. The UKMOD development team are currently working to find useful responses to these issues.

Receipt of benefits or tax credits based on past circumstances is not modelled. It is effectively assumed that entitlement is based on current circumstances. For example, Child Tax Credit and Working Tax Credit payments in practice are based on income earned in the previous year. Final awards are only adjusted if current year income exceeds a threshold.

The UKMOD simulation baseline applies a correction for non-take-up of means-tested benefits and tax credits to reduce the proportions of those entitled who are modelled to receive the benefit/credit. This correction is only approximate. It improves UKMOD’s match for poverty and inequality statistics to official data sources. Nevertheless, some benefits remain over-simulated (Income Support) and others under-simulated (Working Tax Credit and Child Tax Credit). For some applications of UKMOD users are advised to explore the full-take-up option as well.

When using the baseline results from the 2022 to 2026 policy years it is important to remember that no adjustments have been made for demographic changes or changes in the composition or distribution of market incomes since 2019/20, except those captured by uprating by income source.

As Universal Credit gets rolled out to everyone, simulations of the ‘legacy benefits’ tend to be underestimated. Users are advised to consider the detailed sections in this report on further information about the assumptions and estimation quality for the duration of the transition years.

Although the sample size of the FRS survey data is large by international standards, care should be taken when interpreting results, especially whenever considering small sub-groups of the population.

When comparing results for the UK with those obtained from EUROMOD for other countries, it is important to remember that:

1. UK results are based on FRS data, not data from the EU-SILC. These data relate to 2019/20. However, from 2012 to 2017, the EU-SILC makes use of data from the FRS.
2. The reference time period for UK data is (generally) the last month, rather than the previous year (as for other countries in the EU-SILC).

5 REFERENCES

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Reis, S. and Tasseva, V. (2020), "UKMOD/EUROMOD Country Report", https://www.microsimulation.ac.uk/publications/publication-526325/

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De Agostini, Paola (2018a), "EUROMOD Country Report: United Kingdom 2015-2018" https://www.euromod.ac.uk/sites/default/files/country-reports/year9/Y9_CR_UK_Final.pdf

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De Agostini, Paola and Holly Sutherland (2015), "EUROMOD Country Report: United Kingdom 2011-2015" https://www.euromod.ac.uk/sites/default/files/country-reports/year6/Y6_CR_UK_final_13-04-2016.pdf

6 ANNEXES

6.1 Descriptive resources for UK tax and benefit policy

6.1.1 General sources for tax-benefit descriptions/rules

Child Poverty Action Group (2022) “Welfare Benefits and Tax Credits Handbook 2022/2023”, CPAG London

Child Poverty Action Group (2021) “Welfare Benefits and Tax Credits Handbook 2021/2022”, CPAG London

Child Poverty Action Group (2020) “Welfare Benefits and Tax Credits Handbook 2020/2021”, CPAG London

Child Poverty Action Group (2019) “Welfare Benefits and Tax Credits Handbook 2019/2020”, CPAG London

Child Poverty Action Group (2018) “Welfare Benefits and Tax Credits Handbook 2018/2019”, CPAG London

Child Poverty Action Group (2017) “Welfare Benefits and Tax Credits Handbook 2017/2018”, CPAG London

Child Poverty Action Group (2016) “Welfare Benefits and Tax Credits Handbook 2016/2017”, CPAG London

6.1.2 Websites

https://obr.uk/

https://stats.oecd.org/

https://www.gov.uk/

https://www.gov.uk/browse/tax

https://www.gov.uk/browse/benefits

https://www.gov.uk/government/publications

https://www.gov.uk/government/organisations/hm-treasury

https://www.hmrc.gov.uk

https://socialsecurity.gov.scot/benefits

https://www.gov.uk/government/collections/income-tax-statistics-and-distributions

https://www.gov.scot/collections/social-security-scotland-stats-publications

6.2 Uprating factors

Table 6.1 Uprating factors

uprating factor	parameter name	index by simulation year							data sources
		2020	2021	2022	2023	2024	2025	2026	
Default uprating factor (CPI)	$f_cpi	108.7	111.6	121.7	126.7	127.5	127.5	128.5	Until 2022: ONS CPI Annual Average (All Items, D7BT); from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7.
Earnings index	$f_yem	176.2	188.0	197.4	205.3	207.6	210.7	215.0	Until 2022: ONS Average weekly earnings, Table 4 (K54U); from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.6.
Attendance allowance	$f_bdioa	89.2	89.6	92.4	101.8	107.3	107.9	107.9	Until 2023: Attendance Allowance (higher rate); from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
Disability living allowance (mobility)	$f_bdimb	62.3	62.6	64.5	71.0	74.8	75.3	75.3	Until 2023: Mobility component of Disability Living Allowance (higher rate); from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
Incapacity Benefit + Employment and Support Allowance	$f_bdict	114.2	114.7	118.3	130.2	137.2	138.0	138.1	Until 2023: Incapacity Benefit (long term); from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.

uprating factor	parameter name	index by simulation year							data sources
		2020	2021	2022	2023	2024	2025	2026	
Industrial injuries pension	$f_bdiwi	182.0	182.9	188.6	207.6	218.8	220.1	220.1	Until 2023: Industrial Injuries Disablement Benefit; from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
Invalid care allowance + Carer's Allowance	$f_bcrdi	67.3	67.6	69.7	76.8	80.9	81.4	81.4	Until 2023: Carer's Allowance; from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
National insurance retirement pension	$f_boact00	134.3	137.6	141.9	156.2	165.9	170.0	174.3	Until 2023: Old State Pension; from 2024 series projected using OBR March 2023 Economic and fiscal outlook, Annex A, Table A.3.
Severe disablement allowance	$f_bdisv	80.9	81.3	83.8	92.2	97.2	97.7	97.8	Until 2023: Severe Disablement Allowance; from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.

uprating factor	parameter name	index by simulation year							data sources
		2020	2021	2022	2023	2024	2025	2026	
Statutory sick pay	$f_bhlwk	95.9	96.4	99.4	109.4	115.3	116.0	116.0	Until 2023: Statutory Sick Pay; from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
Unemployment benefit (contributory Jobseeker's Allowance)	$f_bunct	74.4	74.7	77.0	84.8	89.4	89.9	89.9	Until 2023: Jobseeker's Allowance (25 and over); from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
War pension	$f_boawr	193.0	194.0	200.0	220.0	232.0	233.3	233.3	Until 2022: War Pension; from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
Widow`s pension/benefit	$f_bsuwd	122.0	122.6	126.4	139.1	146.6	147.5	147.5	Until 2023: Widow's Pension; from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.
Maternity Allowance	$f_bmana	151.2	152.0	156.7	172.5	181.8	182.8	182.9	Until 2023: Maternity Allowance (standard rate); from 2024 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7, CPI.

uprating factor	parameter name	index by simulation year							data sources
		2020	2021	2022	2023	2024	2025	2026	
Mortgage interest payment	$f_xhcmomi	39.4	37.7	41.6	63.3	71.0	73.8	75.8	Until 2022: Bank of England, CFMHSDE; from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.9.
Council Tax: rest of England	$f_tmu1	1817.7	1898.5	1965.7	2053.3	2144.5	2237.6	2334.7	Until 2022: ONS Council Tax Statistics, Table 6 (Greater London); from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 3.1.
Council Tax: Wales	$f_tmu11	1666.9	1731.0	1777.2	1858.3	1941.9	2033.4	2126.8	Until 2022: StatsWales, Composition of average band D council tax; from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 3.1.
Tax free investment income	$f_yiynt	12.9	9.2	48.9	149.7	151.8	154.2	156.5	2001 to 2009: Bank of England IUMWTTA; 2010: Bank of England IUMB6RH; 2011-2022: Bank of England IUMB6VL; from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.9.

uprating factor	parameter name	index by simulation year							data sources
		2020	2021	2022	2023	2024	2025	2026	
Financial capital	$f_afc	100.0	100.0	100.0	100.0	100.0	100.0	100.0	Exogenously assumed
Observed values to be kept constants	$f_const	100.0	100.0	100.0	100.0	100.0	100.0	100.0	Exogenously assumed
Rent CPI	$f_xhcrtCPI	105.4	107.2	110.9	115.9	119.6	122.1	123.1	Until 2022: ONS CPI Index: actual rents for housing; from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7.
Rent RPI	$f_xhcrtRPI	379.5	387.0	401.0	419.2	432.6	441.4	445.3	Until 2022: ONS RPI: housing rent; from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 1.7.
Rent CPI/1%decrease	$f_xhcrtCPIeng	102.9	104.7	108.3	113.2	116.8	119.2	120.2	Until 2017: same as $f_xhcrtCPI. In 2018-2019: forecast 1% reduction from previous year. From 2020: uprated using $f_xhcrtCPI
Council Tax: London	$f_tmu8	1533.9	1621.8	1684.0	1759.1	1837.2	1916.9	2000.1	Until 2022: ONS Council Tax Statistics, Table 6 (Greater London); from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 3.1.
Council Tax: Scotland	$f_tmu12	1308.2	1308.2	1347.0	1383.7	1421.5	1460.3	1500.1	Until 2022: Scottish Government, Council tax datasets, Council Tax by band; from 2023 series projected using OBR March 2023 Economic and fiscal outlook, supplementary economy tables, Table 3.1.

6.3 UKMOD key income concepts

Annex 3 describes some of the key income concepts in UKMOD and lists their corresponding variable names:

- **Components of disposable income:**

Income from employment and self-employment: ils_earns (UKMOD variable name)
Original/market income: ils_origy
Means-tested non-pension benefits: ils_benmt
Non-means-tested non-pension benefits: ils_bennt
Pensions: ils_pen
All benefits: ils_ben = ils_pen + ils_benmt + ils_bennt
Direct taxes: ils_tax
Employee National Insurance contributions: ils_sicee
Self-employed National Insurance contributions: ils_sicse
Other National Insurance contributions (non-existent in the UK): ils_sicot
All employee/self-employed/other National Insurance Contributions: ils_sicdy = ils_sicee + ils_sicse + ils_sicot
Disposable income: ils_dispy = ils_origy + ils_ben – ils_tax – ils_sicdy

- **National Insurance contributions paid by the employer/state:**

Employer National Insurance contributions: ils_sicer
Credited National Insurance contributions (in 2020 only with simulation of Covid-19 shocks and Coronavirus Job Retention Scheme): ils_sicct

- **Original/market income in more detail:**

Non-simulated:
Employment income: yem
Self-employment income: yse
Investment income: yiy
Income from odd jobs: yot01
Property income: ypr
Personal pension: ypp
Private transfers (non-taxable): yptot
Received maintenance payment: yptmp
Maintenance paid: xmp
Coronavirus Job Retention Scheme contribution paid by employer (in 2020 only with simulation of Covid-19 shocks): yemmc_s

Grouped in income lists:
Income from employment and self-employment: ils_earns = yem + yse + yemmc_s (in 2020)
Original/market income: ils_origy = yem + yse + yiy + yot01 + ypr + ypp + yptot + yptmp – xmp + yemmc_s (in 2020)

- **National Insurance contributions in more detail:**

Simulated:
Employee National Insurance Contributions: tscee_s
Occupational pension contribution: tpcee_s
Self-employed National Insurance contributions: tscse_s
Employer National Insurance contributions: tscer_s
Credited (State) National Insurance contributions (in 2020 only with simulation of Covid-19 shocks): tscct_s

Health and Social Health Care Levy: teehl_s, tsehl_s, terhl_s

Grouped in income lists:
Employee National Insurance contributions: ils_sicee = tscee_s + tpcee_s + teehl_s
Self-employed National Insurance contributions: ils_sicse = tscse_s + tsehl_s
Employer National Insurance contributions: ils_sicer = tscer_s + terhl_s
Credited (State) National Insurance contributions (in 2020 only with simulation of Covid-19 shocks): ils_sicct = tscct_s

- **Taxes in more detail:**

Simulated:
Personal Income Tax: tin_s (and although not included in any income list, we also create tin12_s, tin11_s and tin00_s that included the revenues going to Scotland, Wales and the rest of the UK and add up to tin_s)

Non-simulated:
Council tax: tmu

Grouped in income lists:
Direct taxes: ils_tax = tin_s + tmu
Simulated taxes: ils_taxsim = tin_s

- **Benefits in more detail:**

Simulated:
Working Tax Credit: bwkmt_s
Child Tax Credit: bfamt_s
Income Support & income-based Jobseeker's Allowance (unless simulated separately): bsa_s
Income-based Jobseeker's Allowance: bunmt_s
Income-based Employment and Support Allowance: bsadi_s
Pension Credit: boamt_s
Housing Benefit: bho_s
Council Tax Reduction: bmu_s
Sure Start Maternity Grant: bmamt_s
Best Start Grant (Scotland) (since 2019): bmascmt_s
Universal Credit: bsauc_s
Scottish Child Payment (since 2021): bchmt_s
Scottish Child Payment Bridging Payments (2021-2022): bchmt01_s
Benefit cap (reducing Housing Benefit): brd_s
Benefit cap (reducing Universal Credit): brduc_s
Winter Fuel Allowance:boaht_s
Child Benefit: bch_s
Contributions-based Jobseeker's Allowance: bunct_s
Scottish Carer's Allowance Supplement: bcrdicm_s
Scottish Child Winter Heating Assistance (since 2020): bchht_s
Coronavirus Job Retention Scheme (in 2020 only with simulation of Covid-19 shocks): bwkmcee_s
Self-Employment Income Support Scheme (in 2020 only with simulation of Covid-19 shocks): bwkmcse_s

Non-simulated:
Student payments: bedes
Student Loan: bedsl
Attendance allowance: bdioa

Disability Living Allowance: bdisc
Disability Living (mobility) Allowance: bdimb
Personal Independence Payment living allowance: bdiscwa
Personal Independence Payment mobility: bdimbwa
Incapacity Benefit: bdict01
Contributions-based Employment and Support Allowance: bdict02
Industrial injuries pension: bdiwi
Invalid Care Allowance: bcrdi
Severe Disablement Allowance: bdisv
Statutory Sick Pay: bhlwk
Training Allowance: buntr
Statutory Maternity Pay: bmaer
Maternity Allowance: bmana
other non-means-tested benefits: bot
Basic State pension: boact00
Second State Pension: boactcm
War pension: boawr
Widow's pension: bsuwd

Grouped in income lists:
Means-tested non-pension benefits: ils_benmt = bwkmt_s + bfamt_s + bsa_s + bsadi_s + boamt_s + bho_s + bmu_s + bunmt_s + bmamt_s + bmascmt_s (since 2019) + bsauc_s + bchmt_s (since 2021) + bchmt01_s (2021-2022) - brd_s - brduc_s
Non-means-tested non-pension benefits: ils_bennt = bedes + bedsl + bdioa + bdisc + bdimb + bdiscwa + bdimbwa + bdict01 + bdict02 + bdiwi + bcrdi + bdisv + bhlwk + buntr + bot + bmaer + bmana + boaht_s + bch_s + bunct_s + bcrdicm_s + bchht_s (since 2020) + bwkmcee_s (in 2020) + bwkmcse_s (in 2020)
Pensions: ils_pen = boact00 + boactcm + boawr + bsuwd
Simulated benefits: ils_bensim = bwkmt_s + bfamt_s + bsa_s + bsadi_s + boamt_s + bho_s + bmu_s + bunmt_s + bsauc_s + boaht_s + bch_s + bunct_s + bmamt_s + bmascmt_s (since 2019) + bchmt_s (since 2021) + bchmt01_s (2021-2022) + bchht_s (since 2020) + bwkmcee_s (in 2020) + bwkmcse_s (in 2020)- brd_s - brduc_s

<u>Benefits by function:</u>
Childbirth-related benefits: ils_b1_bcb = bmana + bmanc_s + bmaer + bmact_s + bpact_s + bmamt_s + bmascmt_s (since 2019)
Family-related benefits: ils_b1_bfa = ils_b1_bcb + bfamt_s + bch_s + bchmt_s (since 2021) + bchmt01_s (2021-2022)
Education-related benefits: ils_b1_bed = bedes + bedsl + bot
Old-age benefits: ils_b1_boa = boact00 + boactcm + boamt_s + boaht_s
Survivor benefits: ils_b1_bsu = bsuwd + boawr
Disability-related benefits: ils_b1_bdi = bdict02 + bsadi_s + bdioa + bdisc + bdimb + bdiscwa + bdimbwa + bdisv + bdiwi + bchrdi + bchht_s (since 2020)
Unemployment benefits: ils_b1_bun = bunct_s + bunmt_s + buntr + bwkmcee_s (in 2020) + bwkmcse_s (in 2020)
Health and sickness-related benefits: ils_b1_bhl = bdict01 + bhlwk
Housing benefits: ils_b1_bho = bho_s + bmu_s – brd_s
Social assistance/exclusion benefits: ils_b1_bsa = bwkmt_s + bsa_s + bsauc_s – brduc_s
Family and education benefits: ils_b2_bfaed = ils_b1_bfa + ils_b1_bed
Old-age and health benefits: ils_b2_penhl = ils_b1_boa + ils_b1_bsu + ils_b1_bhl + ils_b1_bdi
Social assistance and housing benefits: ils_b2_bsaho = ils_b1_bsa + ils_b1_bho

6.4 UKMOD specific elements

UKMOD includes the following features that are not provided with other EUROMOD family of models:

- **Multi-year data:** In addition to the standard UKMOD input data based on a single-year of FRS data, a multi-year UKMOD input dataset is made available to users: UK_2019_b1. The multi-year dataset is constructed by appending three consecutive UKMOD input data files (i.e. three FRS waves). The increased sample size allows increasing variability in the data especially when analysing subnational reforms affecting subgroups of the population (e.g. lone parents in Scotland and Wales). More details in section 3.3.

- **Country models for the UK four nations:** In the UKMOD model there is the option of choosing to work with subnational country models for England, Wales, Scotland and Northern Ireland. These country models can be used in combination with the multi-year data to increase sample variance. In the simulation analysis they apply only to the households located in the respective country.

- **Forecast policy systems for 2023-2025:** The latest version of UKMOD includes policy systems up to 2025. The forecast systems include policy projections for 2023, 2024 and 2025 based on the different tax and benefits' uprating factors, including earnings growth projections, inflation, etc for these years, forecast by external official sources, usually OBR (see section 2 for details of each tax and benefit projections).

6.5 UKMOD supplementary functionality

UKMOD includes functionality that reflects selected policy responses to short-term economic shocks. This functionality is likely to be of interest to selected readers, and so is reported in this Annex.

6.5.1 Cost of Living Payment (2022 and 2023, *bsaec_s*)

Cost of Living Payments were payable at discrete intervals during 2022 and 2023, legislated to compensate for unanticipated prices rises. Up to three different types of Cost of Living Payment (CLP) could be received:

- low-income payments,
- disability payments, and
- pensioner payments.

All three of these payments could be obtained by a single recipient.

Eligibility

Receipt of qualifying benefits on specific dates passported individuals to a CLP.

The qualifying benefits to receive a low-income payment are:

- Universal Credit
- Jobseeker's Allowance (income-based)
- Employment and Support Allowance (income-based)
- Income Support
- Pension Credit
- Child Tax Credit
- Working Tax Credit

The qualifying benefits to receive a disability payment are:

- Attendance Allowance
- Constant Attendance Allowance
- Disability Living Allowance for adults
- Disability Living Allowance for children
- Personal Independence Payment
- Adult Disability Payment (in Scotland)
- Child Disability Payment (in Scotland)
- Armed Forces Independence Payment
- War Pension Mobility Supplement

Finally, pensioner payments were payable to anyone in receipt of a Winter Fuel Payment.

Benefit amounts

The low-income payment included in the model is worth £650 per annum in 2022, and £900 per annum in 2023. The disability payment is worth £150 per annum in both 2022 and 2023. The simulated pensioner payment is worth £300 per annum in both 2022 and 2023.

Influence on taxes and benefits

Cost of Living payments are not taxable and are not counted as income for means-tested benefits or tax credits. Cost of Living payments are not affected by the benefit cap.

Model note: CLPs are included in the model as a single payment, based on receipt of associated qualifying benefits reported in the model's survey data. This approach only approximates practical application of the CLP, as it ignores intra-year changes in benefits eligibility.

6.5.2 Policy responses to Covid-19 (2020, 2021)

Scottish Child Payment Bridging Payments (bchmt01_s)

The Scottish Child Payment Bridging Payments bring together the Covid hardship payments and the Family Pandemic Payment into one payment, made 4 times a year. The benefit will be paid in 2021 and 2022. For elements not specified below, it follows the Scottish Child Payment rules and assumptions.

Eligibility

To receive the benefit, families should meet the eligibility criteria for Free School Meals (section 2.5.9).

Benefit amounts

The payments add up to £540 per year.

Coronavirus Job Retention Scheme[42] (bwkmcee_s, yemmc_s and yem)

Eligibility

Employers who could not maintain their workforce because their operations were affected by coronavirus (Covid-19) could furlough employees and apply for the Coronavirus Job Retention Scheme (CJRS) to cover a portion of their usual monthly wage costs where employees were recorded as being on furlough.

Prior to 1 July 2020, employees on furlough could not undertake any work for their employer other than training. From 1 July, employers were:

- able to flexibly furlough employees – this meant employers could bring employees back to work for any amount of time, and any work pattern;
- still able to claim the furlough grant for the hours furloughed employees did not work, compared to the hours they would normally have worked in that period.

Size of the grant

From 1 March 2020 until 31 July 2020, the CJRS grant amounted to 80% of gross earnings, up to a cap of £2,500 per month, as well as the employer NICs for the time the employee was furloughed.

From 1 July 2020, employers could bring furloughed employees back to work for any amount of time and any shift pattern, while still being able to claim the CJRS grant for the hours not worked.

[42] The description of the scheme is taken from https://www.gov.uk/government/collections/coronavirus-job-retention-scheme.

Wage caps were proportional to the hours an employee was furloughed. For example, an employee was entitled to 60% of the £2,500 cap if they were placed on furlough for 60% of their usual hours. Employers had to pay earnings and employer NICs for the hours employees worked.

From 1 August 2020 until 31 October 2020, the level of the grant was reduced each month. For August, the government paid 80% of wages up to a cap of £2,500 for the hours an employee was on furlough and employers paid employer NICs and pension contributions for the hours the employee was on furlough.

For September 2020, the government paid 70% of wages up to a cap of £2,187.50 for the hours the employee was on furlough. Employers paid NICs and pension contributions and top up employees' wages to ensure they received 80% of their wages up to a cap of £2,500, for time they were furloughed.

For October 2020, the government paid 60% of wages up to a cap of £1,875 for the hours the employee was on furlough. Employers paid employer NICs and pension contributions and top up employees' wages to ensure they received 80% of their wages up to a cap of £2,500, for time they were furloughed.

In November 2020, the scheme was extended until September 2021. From November 2020 to June 2021 the scheme came back to its highest level (i.e. as in August 2020 with a 80% rate and a cap of £2,500) and it was decreased thereafter (in July 2021 it was as in September 2020 and in August and September 2021 as in October 2020).

Employers were able to choose to top up employee wages above the 80% total and £2,500 cap for the hours not worked at their own expense if they wish.

<u>Income tax and National Insurance Contributions (NIC)</u>

Employers and furloughed employees still paid the taxes and NIC on their earnings. This included pension contributions (both employer contributions and automatic contributions from the employee), unless the employee had opted out or stopped saving into their pension.

Until 31 July 2020 employers could claim for these costs for the hours the employee was on furlough, i.e. the state covers the costs. From 1 August employers were required to pay all employer NICs and pension contributions.

Table 6.2 shows Government contribution, required employer contribution and amount employee receives where the employee is furloughed 100% of the time. Wage caps are proportional to the hours not worked.

Table 6.2 Parameters of the CJRS (for employees furloughed 100% of the time)

	Mar20-Jul20	Aug20, Nov20-Jun21	Sep20, Jul21	October 20, Aug21-Sep21
Government contribution:				
Employer NICs	yes	no	no	no
Earnings	80% up to £2,500	80% up to £2,500	70% up to £2,187.5	60% up to £1,875
Employer contribution:				
Employer NICs	no	yes	yes	yes
Earnings	-	-	10% up to £312.5	20% up to £625

Employee receives:	80% up to £2,500	80% up to £2,500	80% up to £2,500	80% up to £2,500

The employer NIC paid by the state are simulated and the result is saved in UKMOD variable *tscct_s* (see section 2.6.3 for details on employer NIC).

We make a number of assumptions to simulate the CJRS:

First, as the policy rules change by calendar month, we use the month of household survey interview to simulate the policy rules in place for that month and for a given individual. For example, someone interviewed in April and simulated to be furloughed will be eligible to the earnings subsidy according to the policy rules in April.

(It should be noted that this approach diverges from the approach used in the simulation of earnings subsidies in the other country models of the EU-wide tax-benefit model EUROMOD. The other country models make use of EU-SILC data on last year's incomes and months spent in different economic activities, so they look at whole-year effects. In comparison, the Family Resources Survey for the UK includes information on past month's income and thus, we attempt to simulate the individuals' situation, taking into account the month they were interviewed.)

Second, we assume that civil servants are not affected. Third, we assume employees are furloughed for the whole month (i.e. the month of their household's interview). Fourth, we do not account for the following eligibility condition: employers can claim for any employees that have been furloughed for at least 3 consecutive weeks (since we cannot identify whether different people work for the same firms, we do not account either for related restrictions to employers on the maximum number of employees they can furlough).

Self-Employment Income Support Scheme[43] (bwkmcse_s and yse)

Eligibility

Individuals, whose business was adversely affected by Covid-19, could apply for a grant from the Self-Employment Income Support Scheme (SEISS). They needed to be a self-employed individual or a member of a partnership and:

- For the first to third grant (May20-Jan21)/fourth and fifth grant (Feb21-Sep21):
    - to have traded in the tax year 2018 to 2019/2019 to 2020 and submitted a Self - Assessment tax return on or before 23 April 2020/2 March 2021 for that year
    - to have traded in the tax year 2019 to 2020/2019 to 2020 and 2020 to 2021
    - intended to continue to trade in the tax year 2020 to 2021/2021 to 2022

The business could have been adversely affected by coronavirus if, for example, the self-employed:

- were unable to work because they:
    - were shielding
    - were self-isolating
    - were on sick leave because of coronavirus
    - had caring responsibilities because of coronavirus
- have had to scale down or temporarily stop trading because:
    - their supply chain had been interrupted
    - they had fewer or no customers or clients
    - their staff were unable to come in to work

[43] The description of the scheme is taken from https://www.gov.uk/guidance/claim-a-grant-through-the-coronavirus-covid-19-self-employment-income-support-scheme.

Trading profits must had been no more than £50,000 per year and at least equal to the self-employed person's non-trading income (earnings, income from rent, investment and dividend income, pension income). To work out eligibility the government first looked at the person's Self-Assessment tax return. If the person was not eligible based on that, the government then looked at maximum three previous tax years.

If the self-employed person received the grant they could continue to work, start a new trade or take on other employment including voluntary work, or duties as an armed forces reservist.

Size of the grant

The SEISS grant was based on the person's average trading profit over the 3/4 tax years for the first to third/fourth and fifth grants. The average trading profit was worked out by adding together the person's total trading profits or losses.

The SEISS paid out five grants. The first grant was worth 80% of average monthly trading profits, paid out in a single instalment covering 3 months' worth of profits, and capped at £7,500 in total. Eligible self-employed could apply for the first grant between 12 May and 13 July 2020.

The second grant was paid out to eligible self-employed, whose business had been adversely affected on or after 14 July 2020. Eligible self-employed could apply for the second grant between 17 August and 19 October 2020. This grant was worth 70% of the person's average monthly trading profits, paid out in a single instalment covering a further 3 months' worth of profits, and capped at £6,570 in total. Self-employed could claim for the second grant even if they did not make a claim for the first grant.

The amount of the third and fourth grants was as the first one and each covered three months as well, and could be claimed from November 2020 to January 2021 and February 2021 to April 2021 respectively.

The fifth grant also covered 3 months' worth of profits but its application period lasted the 5 months from May 2021 to September 2021 (therefore, it had to be smoothed out for longer). It was as the previous ones for people with a turnover reduction of 30% or more, while it was only 30% of average monthly trading profits and capped at £2,850 for people with a reduction of less than 30%. Table 6.3 summarises the parameters of the scheme.

Income tax and National Insurance Contributions (NIC)

The grant is subject to income tax and self-employed NIC.

Table 6.3 Parameters of the SEISS for applications made in May-July and August

	May20-Jul20, Nov20-Jan21, Feb21-Apr21	Aug20-Oct20	May21-Sep20
Government contribution:			
Average trading profits	80% up to £7,500, covering 3 months' worth of profits	70% up to £6,570, covering 3 months' worth of profits	80%/30% up to £7,500/£2,850 covering 3 months' worth of profits, for those with a turnover reduction of 30% or more/less than 30%

Self-employed person's contribution:			
Self-employed NICs	yes	yes	yes

We make a number of assumptions to simulate the SEISS:

First, we do the same assumptions as for CJRS with respect to policy rules changing by calendar.

Second, in the simulation of the grant, eligibility is restricted to those with self-employed income less than £50k per year and at least equal to the sum of non-trading income, and who have been in current self-employment for at least a year. We do not condition on having been adversely affected by the pandemic. In the Family Resources Survey we do not have information on the person's trading profits in the previous years. We use instead information on the total amount from self-employment based on profit or income for self-employed (UKMOD variable *yse*/FRS variable *seincam2*). We only compared the difference between this variable before and after the shock to classify people to the two levels in the fifth grant. We also use information on the number of years in current self-employment to approximate if the person has had a Self-Assessment tax return in the previous tax year (UKMOD variable *yseny>=1*).

Modelling of Covid-19 shocks in 2020 and 2021 and unemployment shocks until 2025

Shocks due to the Covid-19 pandemic are accommodated by UKMOD in two ways. First, in 2020 and 2021, UKMOD accounts for support received under the Coronavirus Job Retention Scheme (CJRS) and the Self-Employment Income Support Scheme (SEISS). Second, between 2020 and 2025, UKMOD also accounts for projected changes to the unemployment rate due to the Covid-19 pandemic.

Hereafter, the term "pre-shock" will sometimes be used to refer to incomes or people's characteristics before modelling Covid-19 shocks. In 2020 or 2021, the term "pre-Covid-19 income" is also used to refer to the situation before modelling of Covid-19 shocks.

The baseline simulations in UKMOD include the simulation of Covid-19 shocks. This is done via the LMA extension (section 2.3).

The remainder of this section documents the external data used to model the Covid-19 shocks and describes how the shocks are simulated.

Data on unemployment, self-employed affected by hours reduction, furloughing and SEISS take-up

Projections for the unemployment rate are drawn from the Office for Budget Responsibility (OBR) in their November 2022 Economic and fiscal outlook. For the percentages of self-employed affected by an hours reduction, data are drawn from the Understanding Society COVID-19 survey from Apr20 to Jul20, and from Aug20 onwards the proportion that this shock represented as a percentage of the SEISS take-up is assumed constant. In the absence of reliable data on the magnitude of these reductions, it is assumed that affected self-employed workers reduced their hours by 50%. For the caseloads of furloughed workers and SEISS take-up, information is drawn from HM Revenue & Customs (HMRC). Table 6.4 shows the unemployment rate in 2020-2026 and Table 6.5 shows the proportion of self-employed affected by earnings reduction 2020-2021.

Table 6.4 LFS unemployment 2020-2025

	2020	2021	2022	2023	2024	2025

LFS unemployment	0.046	0.049	0.048	0.043	0.042	0.042

Note: Projections from 2021 onwards. Table T1.1 of the OBR October 2021 Economic and fiscal outlook.

Table 6.5 Proportion of self-employed affected by earnings reduction 2020-2021

	Apr20-Jul20	Aug20-Oct20	Nov20-Jan21	Feb21-Apr21	May21-Sep21
LFS unemployment (rate, per cent)	0.67	0.60	0.57	0.50	0.33

Note: we use data from the Understanding Society COVID-19 survey from Apr20 to Jul20, and from Aug20 onwards the proportion that this shock represented as a percentage of the SEISS take-up is kept constant.

We use furlough caseloads from HMRC broken down by industry. To obtain the proportion of furloughed workers per industry, we divide the caseloads by information on employment by industry from the ONS (to it make comparable, we adjust the ONS/LFS data to the smaller employment by industry found in FRS 2019-20). We then group industries according to the highest proportion of furloughed workers they had over the months of the CJRS, and calculate the proportion of furloughed workers by group each month. This represents the probability of being furloughed. We group industries into:

- Low impact: Agriculture, forestry & fishing; Mining, energy and water supply; Transport & storage; Information & communicationFinancial & insurance activities; Professional, scientific & technical activities; Education; Human health & social work activities
- Medium impact: Manufacturing; Construction; Wholesale, retail & repair of motor vehicles; Real estate activities; Administrative & support services; Other services
- High impact: Accommodation & food services

Moreover, we calibrate these probabilities according to the level of earnings of people to match the total yearly expenditure reported in HMRC statistics (see

). For this, within each industry-month group, we divided people into those with earnings above and below the (yearly) median earnings in the industry group. We then increased the probability of those with low earnings by a percentage, and decrease the probability of those with high earnings so as to maintain the average probability within each industry-month group. This resulted in increasing the probability of low earners by 73% in 2020 and 90% in 2021. The resulting probabilities can be seen in Table 6.6.

Table 6.6 Probability of being furloughed by month, industry group and earnings level in 2020 and 2021

Industry group	Month	2020		2021	
		Low earning	High earnings	Low earning	High earnings
Low impact	Apr	0.260	0.041	0.107	0.006
	May	0.263	0.045	0.088	0.006
	Jun	0.227	0.031	0.076	0.003
	July	0.188	0.029	0.067	0.004
	Aug	0.140	0.026	0.059	0.005
	Sep	0.098	0.014	0.049	0.002
	Oct	0.076	0.016	n/a	n/a
	Nov	0.099	0.014	n/a	n/a
	Dec	0.102	0.018	n/a	n/a
	Jan	0.135	0.021	n/a	n/a
	Feb	0.135	0.027	n/a	n/a
	Mar	0.120	0.023	n/a	n/a
Medium impact	Apr	0.834	0.085	0.328	0.000
	May	0.774	0.121	0.219	0.012
	Jun	0.608	0.105	0.185	0.013
	July	0.465	0.073	0.155	0.008
	Aug	0.326	0.061	0.134	0.012
	Sep	0.242	0.034	0.116	0.004
	Oct	0.203	0.004	n/a	n/a
	Nov	0.341	0.064	n/a	n/a
	Dec	0.348	0.076	n/a	n/a
	Jan	0.436	0.053	n/a	n/a
	Feb	0.420	0.079	n/a	n/a
	Mar	0.381	0.066	n/a	n/a
High impact	Apr	1.000	1.000	1.000	0.609
	May	1.000	1.000	0.939	0.000
	Jun	1.000	0.894	0.531	0.125
	July	1.000	0.664	0.375	0.020
	Aug	0.970	0.239	0.284	0.044
	Sep	0.794	0.150	0.223	0.020
	Oct	0.835	0.258	n/a	n/a
	Nov	1.000	0.770	n/a	n/a
	Dec	1.000	0.834	n/a	n/a
	Jan	1.000	0.998	n/a	n/a
	Feb	1.000	0.929	n/a	n/a

	Mar	1.000	0.805	n/a	n/a

Notes: Data on furloughed workers from Table 3 CJRS time series: number of employments on furlough by sector from HMRC; data on employment from EMP13: All in employment by industry: People (not seasonally adjusted) from ONS. If p = prob CJRS within industry group month, ph/pl = prob CJRS for high/low earnings within industry group month, qh/ql = proportion of high/low earnings within industry group month, ph*qh + pl*ql = p. We then increase a in pl = p (1 + a) and adjust ph = (p - pl*ql)/qh to maintain p, until getting close to the yearly expenditure reported in HMRC statistics. We found a=73% in 2020 and 90% in 2021.

From Jul20, furloughed workers were allowed to do working hours while furloughed. For this, we use statistics from HMRC on the proportion of people on partial furlough at the end of each month, shown in Table 6.7. In the absence of information on the exact hours worked by these partially furloughed workers, we assumed they reduced 50% of their working hours.

Table 6.7 Proportion of people on partial furlough 2020 and 2021

Month	**2020**	**2021**
Apr (there was no partial furlough during Apr-Jun 2020)	n/a	0.40
May (there was no partial furlough during Apr-Jun 2020)	n/a	0.47
Jun (there was no partial furlough during Apr-Jun 2020)	n/a	0.47
Jul	0.21	0.47
Aug	0.31	0.45
Sep	0.39	0.44
Oct	0.41	n/a
Nov	0.35	n/a
Dec	0.37	n/a
Jan	0.28	n/a
Feb	0.27	n/a
Mar	0.29	n/a

Notes: Data from Table 8 CJRS time series: number of employments on furlough by full and flexible furlough from HMRC.

Lastly, we use HMRC statistics on the SEISS take-up rate among potentially eligible population, shown in Table 6.8.

Table 6.8 SEISS take-up 2020 and 2021

Grant	**2020**	**2021**
1st grant May20-Jul20	0.77	n/a
2nd grant Aug20-Oct20	0.69	n/a
3rd grant Nov20-Jan21	0.65	n/a
4th grant Feb21-April21	0.58	0.58
5th grant May21-Sep21	n/a	0.38

Notes: Data from Table 0b - Total SEISS claims up to 7 October 2021 from HMRC.

Simulation of unemployment changes, self-employed affected by hours reduction, CJRS, SEISS and tax-benefit policies in UKMOD

Table 6.9 gives an overview of the modelling of shocks – simulations of unemployment changes (in 2020-2025) and self-employment shocks, CJRS, SEISS and tax-benefit policies (in 2020 and 2021) – going through each relevant policy in the model. There are three important parts to the simulations:

1. Define proportions of (self-)employed to become unemployed, self-employed to be affected by hours reduction, to become furloughed (i.e. receive support from CJRS) and take-up SEISS; define policy parameters of CJRS and SEISS; generate random variables used to select who is to be affected by shocks;
2. Simulate unemployment and self-employment changes – i.e. put (self-)employed into unemployment and reduced hours for self-employed – and support from CJRS and SEISS;
3. Simulate NIC, income tax and benefit entitlements
    - in 2020 and 2021: keep benefit take-up behaviour fixed and ensure new benefit claims only to Universal Credit.

On part 1, the proportions of (self-)employed to become unemployed, self-employed to be affected by hours reduction, to become furloughed (i.e. receive support from CJRS) and take-up SEISS are defined as *constants* in UKMOD. Where the proportions vary by month, these are coded using *condition* parameters. As all assumptions for the nature and size of shocks are modelled within the model, they can be modified by users. Users can not only change the size of these proportions but they can also account for other relevant dimensions (e.g. person's gender or age) by modifying/extending the conditions. For a description of the data used to define the relevant proportions, see previous subsection. For information on the CJRS and SEISS, see sections 0 and 0 respectively.

In part 2, individuals are selected randomly – subject to the proportions and conditions defined in part 1 – to become unemployed, being affected by hours reduction, furloughed and/or take-up SEISS. In the case of new unemployed, UKMOD internally calculates the difference between the unemployment rate in the data (e.g. in FRS 2019-20) and the one defined in the previous section, and uses that difference (only if the one defined is larger than the observed one in the data). For this group, an important part of the simulations is to modify their pre-shock incomes and characteristics, e.g. by setting their earnings, private pension contributions and working hours to 0. In other words, we modify the variables from the FRS micro-data to make the selected employed look like unemployed. We do the same to the hours and earnings of those self-employed affected by hours reductions. These modifications then have a direct effect on the simulation of NIC, tax liabilities and benefit entitlements for these newly unemployed. For those selected to become furloughed or take-up SEISS, we simulate their entitlements to the CJRS and SEISS, according to the policy parameters defined in part 1 and taking into account the person's month of interview in the FRS. For example, someone interviewed in May and simulated to become furloughed will get state support from the CJRS according to the May policy rules. Due to changes to the policy rules, the simulated amount of CJRS support would thus differ for a furloughed worker with the same pre-Covid-19 earnings but interviewed in October. The purpose of accounting for the person's month of interview and policy rules by month is essentially to simulate the income distribution as it would be captured in the future FRS 2020/21, subject to a range of assumptions.

In part 3, NIC, income tax and benefit entitlements are simulated, accounting for the increase in number of unemployed, change in hours worked by self-employed and receipt of support from the CJRS and SEISS. It is important to consider here the simulation of legacy benefits (LB) and Universal Credit (UC) in 2020 and 2021. Due to the take-up assumptions in the model, two issues arise related to: 1) changing benefit take-up and 2) new benefit claims as a result of Covid-19 shocks. We discuss these two issues in turn and then explain how we have addressed them in the model:

On 1), UKMOD first simulates entitlements to LB and then, using information on LB eligibility and take-up, UC is simulated. LB are subject to take-up rates as published by DWP and HMRC (see section 3.2.3). For UC, we distinguish in particular between two groups: i) eligible and simulated to take-up LB are simulated to take-up UC (100 % take-up) and ii) not eligible to LB are simulated to take-up UC subject to (at the time of writing) 89% take-up rate.[44] We also assume based on DWP and OBR estimates that among all LB/UC claimants, 45% in 2020 and 54% are selected randomly to claim UC and the rest LB based on DWP estimates (see section 2.5.25). As a result of the Covid-19 shocks simulations, a pre-Covid-19 UC non-taker from group ii) can become a UC taker after the shocks by moving into group i). This happens when someone becomes eligible to both LB and UC as a result of the shock. Furthermore, the take-up of Council Tax Reduction (CTR) benefit in the model is linked to the take-up of UC: a UC taker is simulated to take up CTR (100% take-up) while the CTR take-up goes below 100% for a UC non-taker. Thus, by letting artificially more people taking-up UC as a result of the Covid-19 shocks, the take-up of CTR also increases. This change in the take-up behaviour of UC and CTR is purely a result of the way the model is set up rather than actual modelling of take-up behaviour. This is an important limitation of the model that needs to be understood as it can have implications for some types of distributional analysis (noteworthy, the higher the take-up of a benefit, the bigger the impact of policy reforms on household incomes).

On 2), as a result of the Covid-19 shocks all new benefit claims can only be to UC. However, this is not ensured by the model and so, new benefit claims can be simulated to both the LB and UC.

To address these two issues, we need to acquire information on people's benefit eligibility and take-up pre-Covid-19 which we can then use to simulate benefit entitlements after the Covid-19 shocks. To do so, we implement a loop which runs twice through a part of the policy spine: in the first run, the model calculates NIC, income tax liabilities and benefit entitlements before the Covid-19 shocks in 2020 and 2021 and also based on the pre-Covid-19 policy rules in 2020. The results on entitlements to LB and UC are stored in separate variables. In the second run, the model simulates the Covid-19 shocks, and in the case of 2020, it also applies the policy rules including the Covid-19 policy measures. When simulating LB and UC, the model uses information on the pre-Covid-19 benefit receipt to ensure a fixed take-up behaviour, i.e. someone simulated to be entitled but not taking-up UC pre-Covid-19 remains a non-taker after the Covid-19 shocks, and that all *new* benefit claims go to UC only (subject to 89% take-up rate). This approach is also used in Brewer & Tasseva (2020) who analyse the distributional impact of the UK policy response to Covid-19 (see Appendix C in Brewer & Tasseva (2020)).

Noteworthy, this loop is only implemented within the 2020 and 2021 policy years as it is clearer what the benchmark scenario is, i.e. the pre-Covid-19 situation in 2020 and 2021. Such a loop has not been added to 2022-2025 simulations when only unemployment shocks are simulated, which are much smaller compared to those simulated in previous years (moreover, as the loop runs the spine twice, running a system requires roughly twice as long). In these systems, instead of using information on pre-shock benefit receipt, benefit units with newly unemployed can only receive UC (with the caveat that they might have been receiving LB before the shock). To deal with the issues above for certain types of analysis, users may consider switching on the extension "Full Universal Credit Assumption" (UCA) in the model which assumes a full roll-out of UC and no LB (section 2.3).

A final word of caution for users is that, as it has hopefully become clear, the simulation of the Covid-19 shocks is subject to a range of assumptions about the size of shocks and who is affected by them. Notably, the simulations do not account for differences e.g. by age and other variables, which has so far been known to matter during the current pandemic (see e.g. Benzeval et al., 2020). We attempted to strike a balance between trying to model the labour market shocks, the breakdowns already provided by HMRC, and the large number of parameters that the shocks introduce in the model.

[44] There is also a third group: eligible but not taking-up LB are simulated to not take-up UC.

Table 6.9 Overview of shocks simulations in UKMOD by policy

Policy in UKMOD	Policy years	Description
ConstDef_uk	2020-2025	Define as constants: - 2020-2025: an extension switch used to rule the simulation (constant ***$shocks***) - 2020-2025: unemployment rate target (***$p_un***), % of self employed being affected by earnings reduction (**$p_mase**) and % of working hours done by self-employed affected (**$mase_hours**) - 2020-2021: grouped industries by CJRS impact (***i_lin***), proportion of furloughed workers by industry-earnings group (***$p_furlough***), % doing working hours (***$furlough_inwork, $furlough_hours***), *and* self-employed taking-up SEISS (***$p_seiss***), which all vary by person's month of interview (***ddt01***) in the FRS - 2020: policy parameters of the CJRS and SEISS (***$mcee_*, $mcse_****) by month, using information on person's month of interview
InitVars_uk	2020-2025	Intermediate variables used in calculations defined
ILSdef_uk, ILdef_uk	2020-2021	Variables for state support from CJRS (***bwkmcee_s***), CJRS employer contribution (***yemmc_s***) and state support from SEISS (***bwkmcse_s***) added to relevant income lists
random_uk	2020-2025	Setting seeds and generating random variables used to select who is to be affected by shocks (***i_rand_un, i_rand_furlough, i_rand_mase, i_rand_seiss, i_rand_furlwork***)

shocks_uk	2020-2025	Policy simulates shocks:
		- 2020-2025: calculating % of employed transitioning into unemployment (based on the difference between the unemployment rate in the data and the target if the latter is larger)
		- 2020-2021: set a loop ("covshocks") which calculates receipt of LB and UC 1) pre-Covid-19 and 2) after Covid-19 shocks
		    ○ Loop starts from follow-up function within policy and ends at the last function in policy covshocks_benreceipt_uk
		    ○ Run 1 of loop: no simulation of labour market changes in 2020 and 2021 and also tax-benefit calculations based on pre-Covid-19 policies in 2020, i.e. pre-Covid-19 income distribution; store information on pre-Covid-19 benefit receipt
		    ○ Run 2 of loop: simulation of Covid-19 shocks in 2020 and 2021 and also tax-benefit calculations after Covid-19 policy response in 2020, accounting for pre-Covid-19 benefit receipt
		- 2020: set WTC, UC and HB amounts: pre-Covid-19 and after UK policy response to Covid-19 in 2020

		- <u>2020-2025</u>: transitions from (self-)employment to unemployment
		    ○ select randomly who to become unemployed based on proportions specified in ConstDef_uk and random variable generated in random_uk (variable ***i_lnu***)
		    ○ modify characteristics and incomes of newly unemployed (e.g. set earning, private pension contributions and working hours to 0, define as actively looking for a job, change employment status to unemployed etc.)
		- <u>2020-2021</u>: becoming furloughed
		    ○ select randomly who to become furloughed based on proportions specified in ConstDef_uk and random variable generated in random_uk (***lmcee_s***)
		    ○ while furloughed select randomly who is doing working hours and what proportion of hours is being done (***i_lhw00sr***)
		- <u>2020-2021</u>: self-employed affected by hours reduction
		    ○ select randomly who is affected based on proportions specified in ConstDef_uk and random variable generated in random_uk (variable ***lmase***) and what proportion of hours is being done (***i_lhw01sr***)
		    ○ Re-calculate self-employed earnings taking into account hours reduction (***yse***)
		- <u>2020-2021</u>: taking-up SEISS grant
		    ○ select randomly who can receive SEISS grant based on proportions specified in ConstDef_uk and random variable generated in random_uk, accounting for SEISS eligibility conditions (e.g. earning up to £50k per year) (***lmcse_s***)
		    ○ adjust self-employed working hours (***lhw01***) and re-calculate total working hours (***lhw***= *lhw00+lhw01*)

cjrs_uk	2020-2021	- If furloughed, simulate amount of state support from CJRS (bwkmcee_s) as well as CJRS contribution paid by employer for September-October 2020 (yemmc_s) - Re-calculate employment earnings taking into account furloughing and hours worked (***yem***)
seiss_uk	2020-2021	- If taking-up SEISS grant, calculate size of grant (bwkmcse_s)
lha_uk	2020	- Set LHA rates: pre-Covid-19 and after UK policy response to Covid-19
tscse_tscee_uk	2020-2021	- Add SEISS to self-employed earnings for calculating self-employed NIC - (For employee NIC, CJRS support already added to relevant income list in ILdef_uk)
tscer_uk	2020	- Simulate NIC paid by the state for furloughed workers (***tscct_s***)

bunct_uk	2020-2025	- Simulate “number of months worked in qualifying period” (***liwmy_s***) to calculate contributions-based JSA for new unemployed

bwkmt_bfamt_uk, bsa_uk, bsadi_uk, bho_uk, bsauc_uk, bmu_uk, bcap_uk	2020-2021	- Simulation of LB after Covid-19 shocks
		  ○ Only take-up benefits if taking them up pre-Covid-19
		- Simulation of UC after Covid-19 shocks
		  ○ If eligible and not taking-up UC pre-Covid-19, remain a UC non-taker
		  ○ **New claims to UC only**: if only becoming eligible to UC after simulation of Covid-19 shocks, take-up UC subject to a take-up rate of 89%
		- Simulation of CTR
		  ○ If taking-up UC pre-Covid-19 and after Covid-19 shocks, take up CTR
		  ○ If not taking-up UC pre-Covid-19 or after shocks, take-up CTR subject to a take-up rate below 100%
		- Simulation of benefit cap on Universal Credit
		  ○ Approximate 39 weeks of grace period after Covid-19 shocks

bwkmt_bfamt_uk, bsa_uk, bsadi_uk, bho_uk, bsauc_uk	2022-2025	- Simulation of LB and UC after shocks ○ Benefit units with newly unemployed can only receive UC (with the caveat that they might have been receiving LB before the shock)
covshocks_benreceipt_uk	2020-2021	Store information from run 1 of “covshocks” loop on pre-Covid-19 receipt of LB (***i_bfamt_b, i_bwkmt_b, i_boamt_b, i_bsa_b, i_bsadi_b, i_bho_b, i_lb_b***) and UC (***i_bsauc_b, i_bsaucft_b, i_brduc_b, i_bcap_b***)

Notes: All elements that belong to the simulations of Covid-19 shocks in the model belong to the so-called Group “Covid-19 shocks”, highlighted by a blue square in the most left column in the model (for definition of Groups see EUROMOD Help file accessible via the User Interface). To expand all elements of the Group, go to tab “Display”, click on option “Expand” and select “Covid-19 shocks”.

6.5.3 Health and Social Health Care Levy (*teehl_s, tsehl_s, terhl_s*)

The Health and Social Care Levy (HSCL) was a social contribution proposed in September 2021 in the UK to support public expenditure on health care. The scheme was planned to affect employers, employees and the self-employed who pay National Insurance contributions, and individuals that would pay were it not for pension age restrictions. The HSCL would impose an additional rate levied in a similar fashion to Class 1 and Class 4 National Insurance contributions.

The original plan for the HSCL was that it would be introduced as a supplement to Class 1 and Class 4 contributions from April 2022 and as a separate scheme from April 2023. At introduction, the new scheme would be payable at a flat rate of 1.25 percentage points of earnings above the Primary Threshold for employees or the Lower Profits Limit for self-employed. However, the scheme was scrapped from November 2022.