EUROMOD

COUNTRY REPORT

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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.[1] The main exceptions are *council tax* and *council tax benefit* which do not apply in Northern Ireland and the *social fund*, a discretionary element of which is managed under fixed local budgets each year.

b) The tax system generally changes in April each year. The main benefit changes take place at the same time, but can also be implemented at other times, usually in June or October.

c) State pension age in 2016 was 63 for women and 65 for men; the state pension age for women started increasing gradually in 2010 from 60 years old it reached 65 years old in December 2018. After that, a phased increasing of the pension age for both men and women is planned. State pension age will reach 66 years old by 2020.

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 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 - the couple (cohabiting or married) or single adult plus any dependent children. 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 or not any partner is the parent of the child is irrelevant).

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 by prices (RPI) with means-tested benefits following the "Rossi" price

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[1] The way it operates in practice may vary across regions and by other characteristics.

index[2] 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 and from 2012 also for income tax allowances and thresholds. On average the CPI rises more slowly than either the RPI or the Rossi index. Only a few elements are adjusted by earnings 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 usually announced in the Autumn Financial Statement (usually in early December) for the following April. Further changes may also be announced in the March/April Budget. 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. From 2017, a new timetable is introduced: the Autumn Budget will be announced in November as the major update on the UK's finances. While in March/April the Government will respond to the Office for Budget Responsibility (OBR)'s forecasts with a Spring Statement.

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 type of benefits is **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 type of benefits is **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 have changed their name, format and administering authority over the past 15 years (see section0). In practice, despite being administered by the tax authorities', tax credits are like cash benefits and are treated as such here. The three types of benefits are reviewed separately in the next section. Table 1 provides an overview of different types of benefits by type:

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[2] "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 until recently the index used to uprate state income-related benefits.

Table 1. Types of Benefits in the UK tax-benefit system

Contributory (aka National Insurance Benefits)	Jobseeker's Allowance (JSA) Employment and Support Allowance (ESA) Retirement Pension Bereavement benefit Maternity Allowance (MA)
Non-contributory, non-means-tested	Child Benefit (CB) Sure Start Maternity Grant Attendance Allowance (AA) Disability Living Allowance (DLA) Personal Independence Payment (PIP) Severe Disablement Allowance (SDA) Carer's Allowance (CA) Scottish Carer's Allowance Supplement (Scotland only) Industrial Injuries Disablement Benefit Guardian's Allowance War Pensions Winter Fuel Allowance
Means-tested	Income Support (IS) Jobseeker's Allowance (income-based) Employment and Support Allowance (income-based) Pension Credit (PC) Housing Benefit (HB) Local Housing Allowance (LHA) Council Tax Reduction (CTR) Working Tax Credit (WTC) Child Tax Credit (CTC) Social Fund Universal Credit (UC)
Other (not strictly) benefits	Statutory Sick Pay (SSP) Statutory Maternity Pay (SMP) Statutory Paternity Pay (SPP) Occupational and approved personal pensions Child support Student loans Foster Allowances

1.2.1 Contributory benefits

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

Jobseeker's Allowance contributory (JSA) is a flat-rate benefit for the unemployed, conditional on active job search with no additions for dependants. Duration of the allowance is up to six months only. Small earnings are disregard and it is paid only for those under the state pension age. Private pension income over £50 per week, results in reductions to JSA payments. It is taxable. There is also a means-tested component to JSA (see section 0 below).

Employment and Support Allowance (ESA): benefit for the sick and long-term incapacitated, conditional on claimants' 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 chapter 2.5.8) 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 have to participate in regular work-focussed interviews in return. From 2012 contributory ESA for those on WRAG is limited to twelve months duration period.

Retirement pension: if individuals meet the contribution conditions when they are over state pension age, they get a flat rate basic pension ("Category A"). If conditions are only partly met, a reduced pension of at least 25% of the basic can be paid. Spouses who do not meet the 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 pension is taxable. For pensioners who contributed to the State Earnings Related Pension Scheme (SERPS) or other state earnings related pension schemes an additional earnings-related pension is payable. This is taxable and there are no additions for dependants.

Bereavement benefit: this 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 the spouse's SERPS entitlement and private pension (in some cases) can also be inherited.

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 0). 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 chapter 1.3). There are no additions for dependants. Maternity Allowance is not taxable.

1.2.2 Non-contributory, non-means-tested benefits

Child benefit (CB) is a universal flat-rate benefit paid to the carer of each dependent child. A dependent child is a child that is either 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. Since 2013 it is effectively taxed for parents who pay income tax at the 40% (or higher) marginal rate.

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 has been replaced (and will be extended) by the **Best Start Grant**.

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.

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 will be fully replaced by the Personal Independence Payment (PIP) by 2018 for working-age adults.

Personal Independence Payment (PIP) is gradually introduced across the country from summer 2013 for new claimants of DLA age 16-64. It should be fully rolled-out by mid 2019[3]. It is very similar to DLA as it is non means-tested, non-contributory and non-taxable benefit. It aims at helping working-age adult with some of the extra costs caused by long-term disability, ill-health or terminal ill-health. As DLA it has two components - a living component and a mobility one. However each component has only two rates: a standard rate and an enhanced rate.

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 dependants. SDA is not taxable. Since April 2002, the benefit is only maintained for existing claimants.

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. There are additions for dependants and the benefit is taxable.

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.

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

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.

War Pensions is an "umbrella" term for a series of payments that may be made to people who have been injured, disabled or widowed as a result of 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 aged over female state pension age, with a supplement paid for the presence of anyone aged over 80. The payment is not taxable and not means-tested.

1.2.3   Means-tested benefits

Income Support (IS) is the main social assistance benefit for working age people whose family incomes are lower than a specified level and 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 chapter 2.5.6). 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 chapter 2.5.3) 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,

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[3] https://www.gov.uk/government/publications/2010-to-2015-government-policy-welfare-reform/2010-to-2015-government-policy-welfare-reform#appendix-6-introducing-personal-independence-payment https://www.benefitsandwork.co.uk/personal-independence-payment-pip/pip-timetable and https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/529079/pip-statistics-to-apr-2016.pdf
 https://www.benefitsandwork.co.uk/news/3646-dla-to-pip-roll-out-behind-schedule

whether or not actual contributions to the cost are made. Rent and Council Tax are not included but are covered separately by *Housing Benefit* and *Council Tax Benefit*. 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. Income Support is assessed weekly. It 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. Income Support for people aged 60 or over, known as Minimum Income Guarantee (MIG), was replaced by Pension Credit in October 2003.

Jobseeker's Allowance (income-based) is the social assistance benefit for the unemployed which may be claimed after entitlement to contributory JSA is exhausted or on top of it, to meet the income needs of the unemployed person and their family. The structure is the same as for *Income Support* (see chapter 2.5.6).

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 contributory JSA is exhausted or on top of it, to meet the income needs of the incapacitated person and their family. The structure is similar to that for *Income Support* (see chapter 2.5.6).

Pension Credit (PC) is the means-tested pension for people aged over female state pension age and is made up of two parts. The Guarantee Credit (PC-GC) is similar to IS in structure. The Savings Credit (PC-SC) rewards older pensioners (65+) who have savings, pension or earned income above the state basic pension with an additional amount, which is reduced as incomes rise beyond a threshold. It is not taxable.

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 of applicable amounts as IS. Income is assessed after income tax and contributions. Families who share their household with other non-dependent adults have deductions made from rent, whether or not actual contributions to the cost are made. Capital rules apply in a similar way as with IS. HB is assessed on weekly income and rent. It is not taxable.

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.

Council Tax Benefit (CTB) provides rebates on Council Tax for low income households. It has a structure similar to HB and is not taxable. From 2012 CTB became discretionary at the local authority level.

Working Tax Credit (WTC) tops up the wage of low paid workers. It is paid 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.

Child Tax Credit (CTC) is paid to families with children, whether or not 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), which is paid regardless of income for those not in the 40% tax bracket or higher; the second component is a per-child payment (higher if the child is disabled) 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.

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.

Universal Credit (UC) is being introduced in stages. It has been phased-in from October 2013 and its full roll-out should be complete by March 2022. It will represent 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) will be combined into a single programme, Universal Credit. It will be administered by the Department for Work and Pensions (DWP), and will be payable to families where no one is in work, and to families on a low income where someone is in work. The government hopes that UC will make it easier for claimants to claim benefits, make the gains to work more transparent, and reduce the amount spent on administration and lost in fraud and error. As well as changes to the way that benefit entitlements are calculated, the conditionality regime faced by Universal Credit recipients in work will be substantially different from that which currently applies. In particular, conditionality will apply to two groups of Universal Credit recipients who currently face no forms of conditionality: some part-time workers will face obligations to seek better-paid or longer-hours work, and some adults without paid work whose partners are in low-paid work will face obligations to look for paid work.

- *Not strictly benefits*

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

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.

Statutory Maternity Pay (SMP) and **Statutory Paternity Pay (SPP)** (starting from 5 April 2015) payable to employees by the employer for the first 18 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. Similar to SSP, both payments are (generally) treated as earnings by the rest of the tax-benefit system.

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[4] Specific hour limits may vary over time.

Occupational (employer-provided) and approved personal pensions are **private pensions** that for the majority of employees replace the State-Earnings-Related-Pension-Scheme (SERPS).

Child Support is child maintenance paid by absent parents. 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.*

Student loans are partly non-means-tested and partly means-tested on parental income.

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

Training allowances and education maintenance allowance are paid under various schemes.

1.2.4   Benefit cap

From 15 April 2013, a "benefit cap" may limit the total amount payable to a benefit unit from certain specific 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

1.3.1   Brief description

Social contributions, known as *National Insurance Contributions (NICs)*, finance current National Insurance (NI) benefits and NI basic retirement pension. Conditions regarding contributions made in the past determine eligibility to contributory benefits. There are four classes of contributions, but the most important, in terms of revenue-raising being 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 retirement 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.

Employees who are contracted out of the state earnings related pension scheme pay a lower rate of contribution, up to the upper earnings limit. Their employers also pay a lower rate, up to the upper earnings limit. Married women who were elected in 1977 or earlier to pay reduced contributions can still do so, as long as their contribution records have been maintained. This means they do not have to pay Class 2 contributions (if self-employed) and only have to pay a lower rate of Class 1 contributions (if employed). A woman who does this can only claim a reduced Category B state pension on the basis of her husband's contributions on retirement, and is not eligible for other contributory benefits.

Class 3 contributions are voluntary and are usually made by UK citizens living abroad, in order 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.

There are some special schemes for small groups such as share fishermen.

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 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 tax payer married couples. From 6 April 2016, a new personal saving 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). In 2009 there were two rate bands: a wide "standard rate" band of 20% and a higher rate of 40%. A top rate was added in 2010. From April 2016 Scotland can apply different tax rate and income bands.

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 tax payers 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 notorious "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 nationally-determined (i.e. different in England, Scotland and Wales) bands according to property value. 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 Benefit - see section 2.5.11).

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 7 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 paid and a scale of proportional rates applies to property transactions, according to the value of the property.

2. SIMULATION OF TAXES AND BENEFITS IN EUROMOD

2.1 Scope of simulation

Not all the taxes and benefits mentioned in the previous section are simulated by EUROMOD. Some are beyond its scope entirely and are neither included in the EUROMOD database nor in its output income variables. Others are not possible to simulate accurately with the available data. They are included in the database and may be chosen as components of output variables, but the rules governing them may not be changed by the model. Table 2 shows which benefits are simulated (or otherwise treated) whereas Table 3 shows which taxes and contributions are simulated.

Table 2 Simulation of Benefits in EUROMOD

| | Variable name(s) | Treatment in EUROMOD | | | | | Why not fully simulated? |
		2016	2017	2018	2019	2020	
Jobseeker's Allowance (contributory)	bunct_s	PS or S	PS or S	PS or S	PS or S	PS or 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.
Jobseeker's Allowance (income based)	bunmt_s	S	S	S	S	S	Simulated as part of Income Support
Employment Support Allowance + Incapacity Benefit (contributory)	bdict01, bdict02	I	I	I	I	I	Inadequate data on length of sickness spell and contribution history
Employment Support Allowance (income based)	bsadi_s	S	S	S	S	S	
Basic State Retirement Pension	boact00	I	I	I	I	I	No data on contribution history or retirement date
Earnings related state pension	boactcm	I	I	I	I	I	Contribution history unknown

	Variable name(s)	Treatment in EUROMOD					Why not fully simulated?
		2016	2017	2018	2019	2020	
Pension Credit	boamt_s	S	S	S	S	S	
Winter Fuel Allowance	boaht_s	S	S	S	S	S	
Bereavement Benefit	bsuwd	I	I	I	I	I	No data on deceased husband's contributions or date of widowhood
Maternity Allowance(*)	bmana (bmanc_s)	I	I	I	I	I	No data on pregnancy dates, contribution conditions, previous earnings.
Statutory Sick Pay	bhlwk	I	I	I	I	I	No data on qualifying conditions
Statutory Maternity/Paternity Pay(*)	bmaer (bmact_s)	I	I	I	I	I	No data on pregnancy dates or previous employment record or earnings.
Attendance Allowance	bdioa	I	I	I	I	I	Insufficient information on disability
Disability Living Allowance	bdisc, bdimb	I	I	I	I	I	Insufficient information on disability
Personal Independence Payment	bdiscwa, bdimbwa	I	I	I	I	I	Insufficient information on disability
Severe Disablement Allowance	bdisv	I	I	I	I	I	Insufficient information on disability
Carers Allowance	bcrdi	I	I	I	I	I	Insufficient information on disability
Carers Allowance Supplement (Scotland)	bcrdi	-	-	-	PS	PS	Eligibility for entitlement is based on actual receipt of CA and region of residence.
Industrial Injuries Disablement Benefit	bdiwi	I	I	I	I	I	Insufficient information on disability
War Pension	boawr	I	I	I	I	I	Insufficient information on injury
Child Benefit	bch_s	S	S	S	S	S	
Child Tax Credit	bfamt_s	S	S	S	S	S	

	Variable name(s)	Treatment in EUROMOD					Why not fully simulated?
		2016	2017	2018	2019	2020	
Working Tax Credit	bwkmt_s	S	S	S	S	S	
Income Support	bsa_s	S	S	S	S	S	
Housing Benefit	bho_s	S	S	S	S	S	
Local Housing Allowance	bho_s	S	S	S	S	S	
Universal Credit	bsauc_s	S	S	S	S	S	Replacing other means-tested benefits gradually from late 2013
Council Tax Benefit	bmu_s	S	S	S	S	S	From 2013 administered at local level cannot model details of local schemes[5].
Social Fund		E	E	E	E	E	No data; cannot model local discretion
Educational Maintenance Allowance	bedes	I	I	I	I	I	Insufficient information on school attendance
Sure Start Maternity Grant	bmamt_s	S	S	S	S	S	
Best Start Grant	bmascmt_s	-	-	-	S	S	Introduced in Scotland from 2019
Benefit cap	brd_s	S	S	S	S	S	Introduced from 2013

Notes: "-": policy did not exist in that year; "E": *excluded* from the model as it is neither included in the micro-data nor simulated; "I": *included* in the micro-data but not simulated; "PS" *partially simulated* as some of its relevant rules are not simulated; "S" *simulated* although some minor or very specific rules may not be simulated.
(*) For consistency across time, the baseline uses non-simulated variables as reported from FRS and uprated in line with Government announcements. For 2015 system onward, simulation of Maternity Allowance (bmanc_s) and Statutory Maternity/Paternity Pay (bmact_s and bpact_s) can also be simulated using the Parental Benefits switch.

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[5] From 2013 Council Tax benefit has been made the responsibility of individual local authorities. It is therefore likely that as time goes by the nature of the scheme will vary considerably by local area and may not operate at all in some. In EUROMOD we currently assume that the 2012 national scheme continues to apply in following years, with parameters uprated in line with those for IS and HB in Scotland and Wales. In England, we take into account likely budget cuts due to austerities measures assuming a 10.6% reduction to the amount of Council Tax benefit effectively available under the new schemes.

Table 3 Simulation of taxes and social contributions in EUROMOD

	Variable name(s)	Treatment in EUROMOD					Why not fully simulated?
		2016	2017	2018	2019	2020	
Income tax	tin_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	Special schemes for small groups are ignored.
Council Tax	tmu	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	Implicit rate calculated from recorded contribution and earnings

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

2.2   Order of simulation and interdependencies

Table 4 shows the order in which the main elements of the UK system are simulated.

The operation of the Minimum Wage (adjusts *yem*) potentially affects all instruments related to original income. That is why this is calculated first.

Next, employee and self-employed National Insurance contributions (*tscee_s and tscse_s)* are simulated followed by National Insurance contributions for employers (*tscer_s)*. After the simulation of SICs, unemployment benefit (contribution based JSA – *bunct_s)* is simulated. Contribution-based JSA is taxable, therefore it must be simulated before income tax. The simulation of winter fuel allowance (*boaht_s)*, Child Benefit (*bch_s)*, Income Tax Allowance *(tinta_s)* and income tax (*tin_s)* has been done next, followed by the reduction of the child benefits for high earners (*bchrd_s)*.

The means-tested tax credits: Working Tax Credit - WTC (*bwkmt_s)* and Child Tax Credit – CTC (*bfamt_s)* are based on gross income before income tax and National Insurance contributions. They have been simulated after SIC and taxed in line with the order of simulation.

The income tests for means-tested benefits also take account of income from Jobseeker's Allowance (JSA - contributory unemployment benefit) and Child Benefit (*bch_s)*. Therefore, these non-means-tested benefits must be simulated before Income Support, income-based JSA *(bsa_s),* Pension Credit (*boamt_s)* and income-based Employment and Support Allowance (*bsadi_s)*. Housing Benefit (*bho_s)* and Council Tax Reduction *(bmu_s)* include CTC and WTC in their means-test and their calculation depends on whether or not Income Support (income-based JSA or Pension Credit or income-based ESA) is received. Therefore, they are simulated

after other means-tested benefits. A Benefit Cap places a limit to the maximum amount of benefits (of specific types) that a family can receive and therefore it is simulated last.

The new simulation of Universal Credit (UC) (*bsauc_uk*) is independent from other means-tested benefits for working-age people. However, to allow the consistency of take-up behaviour between legacy (before UC) and universal credit system, EUROMOD first computes all the means-tested benefits replaced by UC and then computes UC. On the other hand, the amount of UC needs to be known before computing Council Tax Reduction (*bmu_s*). Therefore, UC is simulated after Housing Benefit (*bho_s*) and before Council Tax Reduction (*bmu_s*).

Finally, the Benefit Cap (respectively *brd_s* and *brduc_s*) is applied to benefit units that are receiving Housing Benefit (HB) or Universal Credit (UC) which fulfil certain criteria and exceed a certain amount of total income from 'selected benefits' (see section 1.2.4 for more information).

Table 4 EUROMOD Spine: order of simulation

Policy	2016	2017	2018	2019	2020	Description of the instrument	Main output
BTA_uk	switch	switch	switch	switch	switch	DEF: settings for modelling benefit non take-up (switch on/off to apply)	- - -
random_uk	on	on	on	on	on	DEF: Generate random number for bdisc_uk	- - -
SCT_uk	switch	switch	switch	switch	switch	SWITCH: keep Scottish observations	- - -
WLS_uk	switch	switch	switch	switch	switch	SWITCH: keep Welsh observations	- - -
PAA_uk	switch	switch	switch	switch	switch	DEF: Pension Age Adjustment - changes in earnings and pensions due to increase in female state pension age (switch on/off to apply 2011-onwards only)	- - -
yem_uk	off	off	off	off	off	DEF: Minimum wage (switch on/off to apply)	- - -
neg_uk	on	on	on	on	on	DEF: recode to 0 negative self employed income	- - -
bmact_uk	switch	switch	switch	switch	switch	BEN: Statutory Maternity Pay (off by default)	bmact_s
bmanc_uk	switch	switch	switch	switch	switch	BEN: Maternity Allowance (off by default)	bmanc_s
bpact_uk	switch	switch	switch	switch	switch	BEN: Statutory Paternity Pay (off by default)	bpact_s
bdisc_uk	on	on	on	on	on	BEN: DLA reduce number of recipients (post 2011)	bdisc
bcas_uk	on	on	on	on	on	BEN: Scottish care allowance supplement (from Sept 2018	bcrdi
tscee_tscse_uk	on	on	on	on	on	SIC: employee and self-employed national insurance contribution	tscee_s and tscse_s
tscer_uk	on	on	on	on	on	SIC: employer national insurance contribution	tscer_s
bunct_uk	on	on	on	on	on	BEN: contributory unemployment benefit (Job Seekers Allowance)	bunct_s
boaht_uk	on	on	on	on	on	BEN: pensioner's annual heating allowance (Winter Fuel Allowance)	boaht_s
bch_uk	on	on	on	on	on	BEN: child benefit	bch_s
tinta_uk	on	on	on	on	on	TAX: personal tax allowance	tinta_s
tin_uk	on	on	on	on	on	TAX: personal income tax	tin_s
bchrd_uk	on	on	on	on	on	BEN: child benefit reduction	bchrd_s, bch_s
bwkmt_bfamt_uk	on	on	on	on	on	BEN: tax credits (Working Tax Credit and Child Tax Credit)	bwkmt_s and bfamt_s
bsa_uk	on	on	on	on	on	BEN: Social Assistance (Income based JSA, Income Support and Pension Credit)	bsa_s
bsadi_uk	on	on	on	on	on	BEN: Income-based Employment and Support Allowance (ESA)	bsadi_s
bho_uk	on	on	on	on	on	BEN: housing benefit and local housing allowance	bho_s
bsauc_uk	on	on	on	on	on	BEN: Universal Credit	bsauc_s
bmu_uk	on	on	on	on	on	BEN: council tax benefit/support	bmu_s
bmamt_uk	on	on	on	on	on	BEN: Sure Start Maternity Grant	bmamt_s
bmascmt_uk	n/a	n/a	n/a	on	on	BEN: Best Start Grant (for Scotland)	bmascmt_s
bcap_uk	on	on	on	on	on	BEN: Total benefits capped	brd_s

2.3 Policy switches

There are eight switches used in the UK model.[6]

First, there is a switch controlling **benefit take-up modelling** (*BTA_uk*). If the switch is set to *on* then partial take-up is applied (the default), otherwise (*off*) full take-up is assumed.

The **Pension Age Adjustment** switch (*PAA_uk*) allows a choice between modelling policies taking into account increases in female pension age introduced from autumn 2010 (*on*) and modelling policies ignoring this change (*off*). The switch is set to *on* by default).

The **Full Year adjustment** switch (*FYA_uk*) controls the transition from Disability Living Allowance (DLA) and Personal Independence Payment (PIP) in policy *bdisc_uk* which started in 2013 and should be fully implemented by 2018. The switch default value depends from the combination of datasets and policy year. It is by default *off* for all datasets collected from 2013 onward as they record entitlement to either PIP or DLA. It is by default *off* in 2013 system (with any dataset) as the first phase of introduction of PIP involved a reduced number of post codes. It is by default *on* from 2014 system onward (for datasets previous to 2013) to take into account the gradual transition from DLA to PIP.

The **Parental Benefits** switch (PBE_uk) controls Maternity Allowance (*bmanc_uk*), Statutory Maternity Pay (*bmact_uk*) and Statutory Paternity Pay (*bpact_uk*) policies. It is set to *off* by default in the baseline from 2015 onward, hence it works with input data from 2015.

The **selection of Scottish Households** (SCT_uk) and the **selection of Welsh Households** switches (WLS_uk) allow users to work respectively with the Scottish or Welsh subset of input data. These switches are both *off* by default in the UK baseline. However, SCT_uk is set to *on* by default for the Scottish baseline, while WLS_uk is set to *on* by default for the Welsh baseline.

The **Full Legacy Benefits Assumption** switch (LBA) and the **Full Universal Credit Assumption** switch (UCA) are used in the Universal Credit policy (*bsauc_uk*) to controls the transition between legacy benefits and Universal Credit. Both switches control the value of the constant *$UCtransition* in ConstDef_uk. LBA_uk sets *$UCtransition*=0 when no universal credit exists and only means-tested benefits from the legacy system apply. UCA_uk sets *$UCtransition*=1 assuming means-tested benefits from the old system are no longer available. Both switches are by default set to *off* and baseline includes transition from legacy benefits to universal credit starting from 2014.

2.4 National Minimum Wage and National Living Wage

- *Brief description*

A national minimum wage (NMW) was introduced 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 in order to validate earnings.

From April 2016 employees age 25 and over are entitled to the National Living Wage (NLW).

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[6] Policy switches are denoted with 'switch' in the policy spine (for a given policy year), while their default values (*on* or *off*) are set in a separate dialogue box in the model, accessed via Country Tools > Set Switches in the EUROMOD User Interface (UI).

- *Eligibility conditions*

The Minimum wage covers most employees except for those exempted for various reasons. Our data do not allow EUROMOD to account for exemptions.

- *Amounts*

In June 2016 the National Minimum Wage was £6.7 per hour for employees aged 22 and over, £5.30 for those aged 18-21 and £3.87 for those under 18 and not of compulsory school-age. For the rates for the other policy years, refer to Table 5. There are no minimum wage regulations for children of compulsory school age. In April 2016 the National Living Wage was set to add £0.5 per hour to the National Minimum Wage of employees age 25 and over.

Table 5 Rate of the National Minimum Wage and National Living Wage (2016 to 2020)

As of…	**Jun-16**	**Jun-17**	**Jun-18**	**Jun-19**	**Jun-20**
Fiscal year:	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**
	£ per hour	**£ per hour**	**£ per hour**	**£ per hour**	**£ per hour**
Age 25+	7.2	7.5	7.83	8.21	8.72
Aged 22+	6.7	7.05	7.38	7.7	7.92
Aged 18-21	5.3	5.6	5.9	6.15	6.33
Aged 16-17	3.87	4.05	4.20	4.35	4.48

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20. OBR Economic and Fiscal Outlook March 2019.

EUROMOD Notes: The implementation in EUROMOD checks that individuals are receiving at least the National Minimum Wage. Where this does not seem to be the case in the data, the EUROMOD calculation increases the income by calculating income based on the number of hours worked on the national minimum wage. From 2016 system, EUROMOD checks that individuals age 25 and over receive at least the National Living Wage and in a similar manner as for NMW, where this is not the case in the data, EUROMOD increases the individual income based on the hours worked and the NLW hourly rate.

2.5   Social benefits

2.5.1   Winter Fuel Allowance (*boaht_s*)

This is an annual allowance paid to any household containing a person aged over the state pension-age limit for women (which has been linearly increasing from 2012) and is intended to cover extra heating costs for elderly people during winter months. The benefit is paid at household level (*tu_household_uk*).

- *Definitions*

A fixed annual amount is paid per household, according to whether any household member is aged over the age-threshold and whether any is aged over 80.

- *Eligibility conditions*

The general eligibility criterion is age though the amount varies according both to age and household composition (see Table 6).

- *Income Test*

Winter Fuel Allowance is a universal, non-means-tested benefit.

- *Benefit amount*

The benefit amounts and age thresholds for the Winter Fuel Allowance over the policy years are laid out in the Table 6.

Table 6 Winter Fuel Allowance benefit amounts and age conditions 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17	Jun-17 2017/18	Jun-18 2018/19	Jun-19 2019/20	Jun-20 2020/21
Age threshold	63	64	65	65	65
	£ per year	£ per year	£ per year	£ per year	£ per year
At least one member of the HH is aged over the threshold	200	200	200	200	200
At least one member of the HH is aged 80 or over	300	300	300	300	300

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

EUROMOD notes: The winter fuel allowance is assumed to be shared equally between all eligible household members.

- *Interaction with taxes and other benefits*

The allowance is non-taxable and it is not taken into account in any other instrument.

2.5.2 Contributory Jobseeker's Allowance (*bunct_s*)

Contributory Jobseeker's Allowance 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 dependants' additions. There is no relationship with past earnings, beyond the contribution condition. Contributory JSA is payable for six months only.

- *Definitions*

The unit of assessment is the individual: *tu_individual_uk*.

- *Eligibility conditions*

There are four main eligibility conditions for contributory JSA:

- **Age**: to be eligible for contributory JSA woman needs to be aged between 18-59 (or below the female state pension age) and man between 18 and 64;

- **Actively seeking employment**: the claimant must be available for (and show proof of actively seeking) full time employment. This criterion is not simulated in EUROMOD;

- **Contribution record**: the claimant must have paid or been credited sufficient NI contributions in the two tax years before the benefit year of claim;

- **Work hours:** the claimant should not count as being in full-time paid work (from 2011 people working 16 or more hours per week are considered in full-time work).

- *Income Test*

Contributory Jobseeker's Allowance itself is not means-tested. However, there are two ways in which the basic benefit is reduced £ for £:
- with any earnings[7] (*yem+yse*) after the first disregarded amount of £5 per week, or
- any occupational or private pension (*ypp+ boactcm*) over £50 per week.

- *Benefit amount*

See the Table 7 for the different rates across the policy years.

Table 7 Amount of contributory Jobseeker's Allowance by age for 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
18-24 years old	57.90	57.90	57.90	57.90	59.07
25 or over	73.10	73.10	73.10	73.10	74.58
Occupational and personal pension disregard	50.00	50.00	50.00	50.00	50.00
Earnings disregard	5.00	5.00	5.00	5.00	5.00

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

- *Interaction with taxes and other benefits*

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

EUROMOD notes: The FRS data do not contain the required information to establish the contribution record of individuals. Instead, two options have been implemented. Firstly, in the current baseline eligibility is taken from the data (*bunct*>0) providing the other eligibility conditions outlined above are satisfied. For those currently in receipt of contributory 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. In order to simulate the monthly amount reported in the data, it is assumed that unemployment benefit is received for the whole year. The second option is to fully simulate eligibility. This option is switched off by default. The FRS data only allow us to establish whether an individual has worked for two years at some point (*liwwh*) while contributory JSA requires the individual to have worked in the last two years. Therefore, the eligibility for contributory JSA is overestimated, if fully simulated. Model also allows (the last function in the policy) to choose the option for the maximum duration of the contributory JSA to be simulated as lasting six months (which is the maximum entitlement for this benefit).

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[7] Unless an individual earns more than their entitlement to contributory JSA plus any disregards. If that is the case, he/she would no longer be eligible.

2.5.3   Working Tax Credit (*bwkmt_s*) and Child Tax Credit (*bfamt_s*)

Working Tax Credit and Child Tax Credit are income-tested refundable tax credits. In practice they are calculated separately from income tax liabilities and their treatment in EUROMOD reflects this and they are treated as benefits. They are calculated on the basis of the previous tax year's annual income.

In principle they are responsive to changes in income or other circumstances if the claimants report it. In practice this is only likely to happen if the claimant's situation changes in a way likely to increase entitlement. However, there is an end-of-year settlement which takes account of changes during the year. Increases in income are disregarded up to a limit which has varied over the period 2011-2013. It was £10,000 in 2011 and was reduced to £5,000 in 2013/14 onwards. EUROMOD uses current income to simulate entitlements and cannot take account of changes in income over the year. Essentially, it assumes that the end of year income disregard is very large (see section   for more information).

- *Eligibility conditions*

Working Tax Credit (*bwkmt_s*) 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,

- working at least 16 hours per week and have a dependent child or

- working at least 16 hours per week and disabled, or from 2011 onwards, aged 60 or more, or

- from 2011, if a couple with children, working at least 24 hours per week between them (and at least one of them working 16 hours), but

- (from 2011/12) those in couples (with or without children) where the partner is on Carers Allowance need to work only 16 hours to qualify

Child tax credit (CTC) (*bfamt_s*) is an income based tax credit paid to families with dependent children, regardless of whether the adults are in employment or not (*i_bfamt_Elig*). It has replaced all the child amounts previously (pre-2009) paid under Income Support, income-based Jobseeker's Allowance and Pension Credit. It is composed of a Family element and a Child element.

- *Assessment unit*

The 'assessment unit' for tax credits is the so-called `benefit unit' (*tu_bu_uk* i.e. single people or couples (including co-habitees) with their dependent children).

- *Amounts*

The calculation of the amount of tax credit can be broken down into a number of steps by calculating:

- The 'relevant period'
- The 'maximum amount'
- The 'relevant income'
- Comparing the 'relevant income' to 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 EUROMOD we assume that eligibility has lasted all year.

The 'maximum amount'

Working Tax Credit contains a number of elements depending on family composition (basic, couple and lone parent element), health (disability and severe disability element), number of hours worked (30 hour element) and age of the claimant (50+ element).

The maximum amount of the Working Tax Credit is calculated by adding up all the elements. In other words, if a benefit unit is entitled to Working Tax Credit according to the criteria outlined above, they qualify for the basic element. Then, according to the family circumstances they qualify for the other elements shown in the table below (*i_bwfmt_ChildCareElig*).

The maximum of the Child Tax Credit is the sum of the family element (£545 per year in 2016/17); and the child element of £2,780 yearly (in 2016/17), paid for each child in the family. Children with disability are entitled to additional payments (*i_bwfmt_FamAmt*) – see Table 8 and Table 9 for amounts up to 2020.

For example, a lone parent working 30+ hours per week with two children aged three and five years would qualify for the WTC basic element, the WTC lone parent element and the WTC 30+ element.

In addition, they would qualify for the CTC family and two times the CTC child element, i.e. for each child. The elements for both tax credits are annual amounts and are shown in the Table 8, Table 9 and Table 10.

The childcare element (*i_bwkmt_ChildCare*) is 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' essentially 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, i.e. the cost of childcare over the whole year is added together and then divided by the number of weeks that childcare has been used. This average childcare amount is then multiplied by 52 and treated as the annual amount. The childcare element is designed to meet a proportion of those costs up to a set limit. The proportion was decreased to 70% in 2011, up to £175 per week per child if only one child and £300 per week if two or more children.

There is an additional element of the WTC for individuals who are 50 years or older which they can claim for the first 12 months after having moved into work. However, as these are temporary elements, they have not been simulated in EUROMOD.

The 'relevant income' or means-test

The means test is based on the 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 (*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 taken into account. In the simulation we use current short-term income (as reported in the data) and we assume that this reflects the income for the whole year without any substantial change.

Table 8 Working Tax Credit amounts from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per year	Jun-17 2017/18 £ per year	Jun-18 2018/19 £ per year	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
WTC Basic element	1,960	1,960	1,960	1,960	2,000
WTC Lone parent element	2,010	2,010	2,010	2,010	2,055
WTC Couple element	2,010	2,010	2,010	2,010	2,055
WTC 30 hours element	810	810	810	810	830
WTC Disability element	2,970	3,000	3,090	3,165	3,230
WTC Severe disability element	1,275	1,290	1,330	1,365	1,395
WTC Max eligible childcare expenditure, 1 child (per **week**)	175	175	175	175	175
WTC Max eligible childcare expenditure, 2 + (per **week**)	300	300	300	300	300
WTC Proportion of eligible childcare costs covered	70%	70%	70%	70%	70%

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

Table 9 Child tax credit amounts 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per year	Jun-17 2017/18 £ per year	Jun-18 2018/19 £ per year	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
CTC Family element	545	545	545	545	545
CTC extra for child under 12 months	--	--	--	--	--
CTC Child element	2,780	2,780	2,780	2,780	2,840
CTC disability child additional Element	3,140	3,175	3,275	3,355	3,425
CTC Severe disability disabled child additional element	1,275	1,290	1,325	1,360	1,390

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

Comparing the 'relevant income' to the 'threshold figure'

The sum of the relevant income is then compared to the 'threshold figure' which differs according to the tax credit that is being claimed. If a benefit unit is only eligible for Working Tax Credit, then the first threshold figure in 2016 was £6,420. The same threshold applies if a benefit unit claimed Working Tax Credit and Child Tax Credit. However, when a benefit unit is only entitled to Child Tax Credit, the first threshold was £16,105 per year in 2016. See Table 10 for subsequent years' figures.

Calculating the final entitlement

If the 'relevant income' worked out in step 3 is lower than the applicable threshold outlined in step 4, the benefit unit is entitled to the 'maximum' tax credit award that had been calculated in steps 1 and 2. If the 'relevant income' is higher than the applicable threshold, then the amount

of the threshold is subtracted from the 'relevant income'. The difference between the two amounts is then tapered away (at 41%). In this calculation the elements are tapered away in a particular sequence, namely:

- the WTC elements, except for the childcare tax credit element, come first,
- then the childcare tax credit element and
- then the child and any disability elements of the Child Tax Credit.

In 2011 the family element of CTC was only tapered away if the 'relevant income' was in excess of the second threshold, i.e. £40,000. From 2012 the family element is also tapered away at the 41% rate, immediately after the child element. If annual entitlement for either CTC or WTC or their sum turns out to be less than £26 per year, no award of tax credit is made.

Table 10 Child tax credit thresholds from 2016 to 2020

	As of… Fiscal year:	Jun-16 2016/17 £ per year	Jun-17 2017/18 £ per year	Jun-18 2018/19 £ per year	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
First threshold		6,420	6,420	6,420	6,420	6,555
First threshold if not entitled to Working Tax Credit		16,105	16,105	16,105	16,105	16,435
First withdrawal rate		41%	41%	41%	41%	41%
Second threshold		--	--	--	--	--
Second withdrawal rate		--	--	--	--	--

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

- *Interaction with other benefits*

WTC counts in full as income for IS, PC, HB and CTB, so needs to be simulated before these means-tested benefits. It is not taxable, so it can be simulated after income tax.

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

EUROMOD notes: Disability for the purposes of tax credits is assessed on the basis of a disability test assigned by a doctor and receiving a so called 'qualifying benefit'. The medical test cannot be simulated in EUROMOD nor can all the rules around qualifying benefits as some refer to receipt in the past six months. Therefore, eligibility for the disability element has been implemented in EUROMOD 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.

As mentioned above, the additional elements for individuals who are 50 years or older and who have recently moved into work are not simulated as the employment history is incomplete in the data to capture all those that are eligible for this temporary benefit.

In addition, once CTC/WTC 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 on the basis of current circumstances may have been entitled at the time when they made the application.

EUROMOD applies a take-up correction to CTC/WTC by default. See section 2.3 for more information.

2.5.4 Child Benefit (*bch_s*) and high income child benefit charge (*bchrd_s*)

Child Benefit (CB) is a universal flat-rate benefit paid to the person responsible for each dependent child. The amount each benefit unit (*tu_bu_uk* i.e. single people or couples (including co-habitees) with their dependent children) receives depends on the number of dependent children in the benefit unit. A child is defined as dependent if it is 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.

- *Income test*

Child benefit is a universal benefit paid for all dependent children and it is not taxable. However, from 2013, child benefit for high income tax payer parents became taxable and it is effectively fully withdrawn for families with at least one parent earning over £60,000 per year (see details below).

- *Benefit amount*

Child Benefit consists of £20.70 per week for the first or only child in 2016/17. For each additional child £13.70 is paid per week (see Table 11 below for the rates in the other policy years). Essentially the weekly entitlement is CB = £20.70 + (£13.70 * (number of children-1)).

Table 11 Child benefit rates from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Only/Eldest child	20.70	20.70	20.70	20.70	21.12
Other child(ren)	13.70	13.70	13.70	13.70	13.98

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

- *Interaction with other benefits (bchrd_s)*

Child Benefit is not taxable and has been ignored in the assessment of income for means-tested benefits since 2004. However, from 2013 child benefit is subject to the Benefit Cap (see 2.5.12). Moreover, in 2013 if the parent receiving child benefit or his/her partner has income over £50,000 in a tax year, this person is liable to pay tax in respect of child benefit (called the "high-income child benefit charge"). The amount of tax is calculated as a percentage of the total amount of any child benefit paid to them or their partner. The tax payable is 1 per cent of the total amount of the taxable child benefit for each complete £100 income over £50,000. The charge cannot be more than the amount of the taxable child benefit awarded for the year. Therefore if income is over £60,000 in a year, the charge will equal the amount of child benefit awarded. These thresholds have been unchanged since 2013.

EUROMOD notes: In EUROMOD the reduced Child Benefit is calculated by *bchrd_uk* after the income tax calculation. Note that in previous versions of EUROMOD the reduction was treated as additional tax rather than a reduction in benefit.

2.5.5   Scottish Carer's allowance supplement

- *Definitions*

Scottish Carer's allowance supplement *(bcas_s)* is an extra payment for people in Scotland who receive Carer's Allowance. It was first paid in December 2018, and is included in the EUROMOD baseline from years 2019 onwards, if the benefit unit is receiving Carer's Allowance in Scotland.

- *Eligibility conditions*

Scottish carers in receipt of the UK carer's allowance.

- *Income test*

Not applicable for this benefit.

- *Benefit amount*

The supplement is a lump sum paid twice per year.

Table 12 Scottish Carer's Allowance Supplement from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per payment	Jun-17 2017/18 £ per payment	Jun-18 2018/19 £ per payment	Jun-19 2019/20 £ per payment	Jun-20 2020/21 £ per payment
Scottish Carer's Allowance supplement	--	--	221.00	226.20	230.95

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20; https://www.mygov.scot/carers-allowance-supplement/

- *Interaction with other benefits*

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

2.5.6   Income Support (including Income-Based Jobseeker's Allowance) (*bsa_s*)

Income Support is a safety net payment for people of working age who are not expected to seek work, while income-based Job Seekers Allowance is the safety net benefit for people who are able to work. They may not receive contributory JSA at the same time, but their partner can.

EUROMOD notes: In EUROMOD, income-based Jobseeker's Allowance and Income Support are implemented together as the rules are largely the same.

- *Definitions*

The unit of entitlement and income assessment for both benefits is the benefit unit (*tu_bu_uk*) i.e. single people or couples (including co-habitees) with their dependent children.

- *Eligibility conditions*

Eligibility for Income Support is based on being exempt from looking for work, e.g. carers, or lone parents (from 2013/14 this only refers to lone parents whose youngest child is under 5[8]), or people on unpaid parental leave. Additional conditions are that claimants are not full-time students, are under the current female state pension age and do not have savings above £16,000.

Eligibility for income-based Jobseeker's Allowance is based on actively looking for work.

The following additional rules apply to both benefits:

1. Working less than 16 hours per week
2. Having less than £8,000 in capital

- *Income test*

Applicable amount

The applicable amount is the figure representing weekly needs, e.g. the amount the claimant and partner are expected to live on each week. It results from the sum of:

IS/ib-JSA Applicable amount = personal allowances + premiums + housing costs

The personal allowances (*i_bsa_PersAllow*) for both benefits are outlined in the Table 13.

Table 13 Income Support and income-based Jobseeker's Allowance rates (2016 to 2020)

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Single or lone parent 16-17	57.9	57.9	57.9	57.9	59.07
Single 18-24	57.9	57.9	57.9	57.9	59.07
Single 25 or over	73.1	73.1	73.1	73.1	74.58
Lone parent 18 or over	73.1	73.1	73.1	73.1	74.58
Couple one under 18	87.5	87.5	87.5	87.5	89.27
Couple both over 18	114.85	114.85	114.85	114.85	117.18

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

Premia

Premia are amounts that are added to the personal allowance, if the relevant conditions are satisfied (*i_bsa_EligDisPremium* to *i_bsa_DisPremium* and *i_bsa_EligPensPremium1*). Rates of premia are the same for all claimants, irrespective of their age. Relevant premium conditions and weekly rates are listed in the Table 14. A benefit unit can receive several premia.

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[8] 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.

Disability is defined according to receipt of certain disability benefits, called 'qualifying benefits'. Qualifying benefits have to be received within the last six months of claiming IS/ib-JSA according to the 'linking rule' introduced to encourage people with disabilities to move into work without losing their disability premiums if they have to leave work.

The disability premium (*i_bsa_EligDisPremium*) is linked to the following qualifying benefits: Disability Living Allowance (either the mobility component *bdimb* and 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. The latter benefit would not be received at the same time; therefore, this condition has not been simulated. The severe disability premium (*i_bsa_SevDisPremium*) is given if the claimant is receiving one of the following qualifying benefits: Attendance Allowance, the middle or higher rate care component of Disability Living Allowance (*bdisc*), no one is getting the carers allowance (*bcrdi*) for looking after the claimant and there are no non-dependants living in the household. There are additional rules for those registered blind. However, as this condition cannot be identified in the data, this has not been simulated. The conditions for receiving the enhanced disability premium (*i_bsa_DisPremium*) are that the Disability Living Allowance Care Component is received at the highest rate (*bdisc*>£79.15 per week in 2013).

Income Support on grounds of disability was gradually replaced by ib-ESA from 27 October 2008 (effectively from the 2009 system in EUROMOD). See section 2.5.7 for more details.

The carer premium (*i_bsa_CarerPremium*) will be received if the claimant receives the Carer's Allowance (*bcrdi*).

The child elements for IS and ib-JSA are covered by the Child Tax Credit. So a family unit with children entitled to IS and ib-JSA are automatically given CTC too.

Income support and income-based Jobseeker`s allowance premia amounts (per week) are shown in Table 14.

Table 14 Income Support and income-based Jobseeker's Allowance premia, 2016-2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Carer premium - one qualifies	34.60	34.95	36.00	36.85	37.60
Carer premium - both qualify	34.60	34.95	36.00	36.85	37.60
Disability premium - single	32.25	32.55	33.55	34.35	35.05
Disability premium - couple	45.95	46.40	47.80	48.95	49.94
Enhanced disability premium - single	15.75	15.90	16.40	16.80	17.14
Enhanced disability premium - couple	22.60	22.85	23.55	24.1	24.59
Severe Disability – one qualifies	61.85	62.45	64.30	65.85	67.19
Severe Disability- two qualify	123.70	62.45	64.30	65.85	67.19

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

Income assessment

One claim for IS/ib-JSA is made per benefit unit and the entitlement depends on the income of all the members in the benefits unit as well as the composition of the household, i.e. whether there are adult-non-dependants present in the household. The income of other people in the household is not taken into account except via the non-dependent deduction (see below).

Income is defined by *il_IS_means*. It includes gross income from employment and self-employment and all other main current income sources **except** investment income and certain benefits (Housing Benefit and Council Tax Benefit, Attendance Allowance and Disability Living Allowance). In addition, 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*). These are £20 per week for a lone parent; £20 for a disabled person where disability is signalled by receipt of certain benefits (see above on entitlement to disability premium) within the family unit; £10 for couples not qualifying on disability grounds and £5 for others. In addition, small amounts (£10) of war pension and maintenance payments are disregarded. Income from investment income is not included directly in the IS family income assessment. Instead, a tariff income (£1 per week for every £250 capital) is calculated on financial capital between £6,000 and the upper threshold £16,000. Income support and income-based Jobseeker`s allowance earnings disregards and capital limits (per week) are shown in Table 15.

Table 15 Income Support and income-based Jobseeker's Allowance earnings disregards and capital limits from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Single person	5	5	5	5	5
Couple	10	10	10	10	10
Disability	20	20	20	20	20
Lone parent[a]	20	20	20	20	20
	£	£	£	£	£
Capital lower limit	6,000	6,000	6,000	6,000	6,000
Capital upper limit	16,000	16,000	16,000	16,000	16,000

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20; **Notes:** [a] Lone parents on HB or CTB have £25 of their earnings ignored.

Housing costs

Housing costs not covered by Housing Benefit can potentially be included in Income Support (*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.

EUROMOD notes: The EUROMOD implementation does not take into account the limit up to which interest is paid nor the waiting time. 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 Income Support but because our data do not allow us to distinguish them from other charges that are not covered, EUROMOD does not take account of these extra costs in the Income Support calculation.

Multiple 'assessment units' in household and non-dependants

In the case of multiple benefit unit households, simulation of means-tested benefits needs to be coordinated across the units. IS and ib-JSA can be received by each benefit unit living in the same household, but entitlement for each benefit unit might be affected by the presence of other benefit units (through so called 'non-dependent deductions'). Deductions are made from the housing cost element of the Income Support Applicable Amount if there are non-dependent adults in the household in addition to the householder's family unit (*i_bsa_EligHousCosts*). The "householder" in the UK is the person responsible for the rent or mortgage interest (*i_bsa_RespHousCosts*) and he/she is identified in the UK data (*dhr*). The size of the deduction depends on the type of non-dependent. No deduction is made where the person is aged under 18 or where they are aged under 25 and are themselves in receipt of Income Support (IS) (*i_bsa_EligHousCosts*). To establish this latter condition, IS must be simulated for each non-dependent.

Other exemptions from deductions apply when the person is a full-time student, where they are blind, or where they are in receipt of Attendance Allowance (*bdioa*), or the middle or higher rate of the care component of Disability Allowance (*bdimb*).

EUROMOD notes: None of these cases are modelled.

Generally, a single deduction applies to each single person or couple according to the following (for couples, the higher deduction applies and income is aggregated): "Work" in this case refers to whether in full-time work for at least 16 hours or not (*lhw*) and gross income (*il_ISPC_nondep_means*), which is similar to the income definition used for IS assessment but is before the deduction of income tax and contributions. Table 16 sets out the rates for the different income brackets.

Table 16 Non-dependent deductions on Income Support and income-based Jobseeker's Allowance from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Deduction applying if	94.5	95.45	98.30	100.65	102.69
income is above	420	430	439	451	460.14
Deduction applying if	86.1	86.95	89.55	91.7	93.56
income is above	338	346	354	363	370.36
Deduction applying if	75.6	76.35	78.65	80.55	82.18
income is above	253	259	265	272	277.51
Deduction applying if	46.2	46.65	48.05	49.2	50.2
income is above	195	200	204	209	213.24
Deduction applying if	33.65	34	35	35.85	36.58
income is above	133	136	139	143	145.9
Deduction otherwise [a]	14.65	14.8	15.25	15.6	15.92

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20
Notes: [a] An additional condition is that the non-dependant is working fewer than 16 hours per week.

Preliminary IS used for the nondependent deduction

This policy module calculates IS entitlement for all benefit units in the household except the householder-unit. It does so in exactly the same way as in the actual IS calculation except that

the addition of housing needs to the applicable amount is ignored (by definition, non-dependants do not have these needs).

EUROMOD notes: Note that the parameters for IS in this calculation are specified separately to those used in the main IS calculation. When making policy changes, the user should consider whether the calculations should remain so closely aligned (generally they should).

- *Benefit amount*

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

EUROMOD notes: Up to this point, IS and ib-JSA are treated together in the simulation. However, at this final stage they are separated again according to the relevant eligibility criteria for IS (*bsa_s*) and ib-JSA (*bunmt_s*).

EUROMOD applies a take-up correction to this benefit by default. See section 3.3.3 for more information.

- *Interaction with other benefits*

Working Tax Credit and Contributory JSA count as income for IS/ib-JSA purposes so they need to be simulated before IS/ib-JSA. Because of non-dependent deductions and the fact that IS/ib-JSA acts as a passport to maximum HB and CTB, IS/ib-JSA is simulated before HB and CTB. IS is not taxable, while JSA is. However, the tax on ib-JSA is not deducted while the JSA is being paid but reduces the refund received on return to work. Therefore in EUROMOD ib-JSA is not included in the taxable base.

2.5.7 Pension Credit (*boamt_s*)

This is an income maintenance benefit paid to those over pension age (the age threshold moves with the female state pension age; it was 61 in 2012 and 2013, 62 in 2014 and 2015, 63 in 2016, 64 in 2017 and 65 from 2018). It is composed of two elements, the Guarantee Credit (*boamtmm_s*) meant to ensure a guaranteed level of income, and the Saving Credit (*boamtxp_s*), meant to reward those who made provisions for retirement above the Basic State Pension level. Either or both components can be received. Once both the GC entitlement and SC entitlement have been calculated, Pension Credit entitlement is the sum of these two components. The housing costs provisions mirror those described for IS, with one difference. In cases where a deduction had already been made under HB it is also made to Pension Credit (whereas for IS/JSA no deduction is made in such cases).

EUROMOD notes: Pension Credit is implemented in the same policy as Income Support and income-based Jobseeker's Allowance as a number of the rules are very similar such as deductions for non-dependents.

2.5.7.1 Guarantee Credit (*boamtmm_s*)

The aim of the Guaranteed Credit (GC) is to ensure that the income of older people does not fall below an 'appropriate minimum guarantee'.

- *Eligibility*

In order to be eligible, individuals must be over the female state pension age and have benefit unit income (*il_GC_means*) below the 'standard minimum income guarantee'. This level is set out in the Table 17.

Table 17 Pension Credit Minimum Guarantee, 2016-2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Single person	155.6	159.35	163.00	167.25	171.77
Couple	237.55	243.25	248.80	255.25	262.48

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

Unlike for working-age claimants of IS there is no maximum capital limit for Pension Credit.

- *Income test*

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*). Tariff income from capital is included in the income test. Specifically, for every £500 of capital over £10,000, £1 of income is added to income for the purpose of the means-test (*yiviy01_s*).

Applicable amount

The applicable amount is the figure representing weekly needs for GC purposes, the amount the claimant and partner are expected to live on each week. It results from the sum of: personal allowances + premia + housing costs. The personal allowances are shown in Table 17 (i.e. they are equivalent to the level of the guarantee) and the premia are set out in Table 18.

Table 18 Pension Credit (GC) premia and capital limits 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Severe Disability Premium-single or one qualifies	61.85	62.45	64.30	65.85	67.19
Severe Disability Premium-couple (both qualify)	123.7	124.9	128.60	131.70	134.37
Carer Premium- single or one partner qualifies	34.6	34.95	36.00	36.85	37.60
Carer Premium- couple (both qualify)	34.6	34.95	36.00	36.85	37.60
Capital lower limit	10,000	10,000	10,000	10,000	10,000

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

- *Benefit amount*

The income calculated above is then subtracted from the applicable amount and the difference is the Guarantee Credit award.

2.5.7.2   The Savings Credit (SC) (*boamtxp_s*)

- *Eligibility conditions*

Either the individual claimant or their partner has to be 65 or older and have income above the Savings Credit threshold (*il_SC_qualy*). The level of this threshold is shown in Table 19.

- *Income test*

The income taken into account is the same as for the Guarantee Credit except for sources of income linked to work, i.e. Working Tax Credit, Incapacity Benefit, contribution based- ESA and JSA, Severe Disablement Allowance, Maternity Allowance and maintenance payments.

- *Benefit Amount*

The savings credit is calculated using the following steps:

Step 1: calculate the income that counts for GC purposes and includes qualifying income.

Step 2: calculate the minimum guarantee plus any additional amounts.

Step 3: calculate 60% of all income except non-qualifying income above the savings credit threshold (see Table 19 below). This amount is compared with the maximum savings credit which was £13.7per week for a single person and £14.75 for a couple in 2016.

Step 4: if the income calculated in step 1 is smaller than the income in step 2, step 3 will be the savings credit amount.

Step 5: If the income from step 1 is higher than that in step 2, calculate 40% of the total income (including non-qualifying income) above the appropriate minimum guarantee.

Step 6: Deduct the amount from step 5 from step 3 and if positive this is the Savings Credit entitlement.

Table 19 Savings Credit thresholds, maxima and withdrawal rate 2016 to 2020

| | As of… | Jun-16 | Jun-17 | Jun-18 | Jun-19 | Jun-20 |
| | Fiscal year: | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
		£ per week	£ per week	£ per week	£ per week	£ per week
Threshold single		133.82	137.35	140.67	144.38	148.17
Threshold couple		212.97	218.42	223.82	229.67	235.62
Maximum single		13.07	13.20	13.40	13.73	14.01
Maximum couple		14.75	14.90	14.99	15.35	15.66
Withdrawal rate		40%	40%	40%	40%	40%

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

Note that the maximum Savings Credit has being reduced from 2012 onwards and it restarted increasing again from 2017.

EUROMOD notes: EUROMOD applies a take-up correction to this benefit by default. See section 2.3 for more information.

- *Interaction with other benefits*

Because PC has no working hours rule, it may be possible to get both PC and WTC if income is low enough. Any WTC counts as income for PC (GC means). Pension Credit is not taxable.

2.5.8 Income-based Employment and Support Allowance (*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 IB and IS on "grounds of disability" for new claimants.

There are two types of ESA: contributory ESA (c-ESA - *bdict02*) which is not means-tested and it is paid if one satisfies the national insurance conditions; income-based ESA (ib-ESA – *bsadi_s*) which is paid subject to a means test (there is no NI conditions applying in this case). It is possible to receive c-ESA topped up with ib-ESA. C-ESA is not simulated by EUROMOD.

A number of elements for the calculation of ib-ESA are similar to IS/ ib-JSA such as the personal allowances, some premiums and the inclusion of reductions for non-dependants in the calculations.

ESA is worked out in two phases: in the "assessment phase" the individual gets a basic allowance, which 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. This is the "support component" if the individual is assessed to have "limited capability for work-related activity" or the "work-related activity component" if the individual is regarded as being in the "work-related activity group" (WRAG) which means he/she is required to take part in work-focused interviews and possibly undertake some work-related activity.

- *Eligibility Conditions*

The main eligibility rules to qualify for income-based Employment and Support Allowance are:

- o having limited capability for work because of mental or physical conditions, which is determined as part of a work capability assessment;
- o having benefit unit income lower than the applicable amount;
- o having capital less than £16,000;
- o being aged 16 or over and under pension age; not in education; not entitled to Pension Credit (PC), Statutory Sick Pay, Income Support or JSA; not in a couple entitled to joint-claim JSA or IS;
- o being not engaged in full-time work (if a partner is present, also the partner should not be working full-time) and if with a partner, the partner should not be entitled to ib-ESA, ib-JSA or PC in his/her own right.

- *Income Test*

The calculation of the income-based Employment and Support Allowance amount is based on the 'applicable amount' and the income of the claimant and their family unit (Table 20).

The underlined applicable amount is calculated by adding together:

- o the personal allowances (which are the same as IS and ib-JSA);
- o premia (only the enhanced disability, severe disability, carer and pensioner premia may apply); and
- o in the main phase, either the support component[9] or the work-related activity component[10][11]; and

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[9] 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".

o disregards;

o plus certain housing costs if the claimant is responsible for them.

Table 20 Income-based Employment and Support Allowance additional premia from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Work-related activity component	29.05	29.05	29.05[a]	29.05	29.64
Support component	36.2	36.55	37.65	38.55	39.33

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

Notes: [a] See footnote 10 below for changes to the WRA component for new claimants from April 2017.

- *Benefit Amount*

The income and non-dependent deductions are calculated in the same way as for Income Support and these are subtracted from the applicable amount.

EUROMOD notes on implementation

Many of the parameters related to ESA are the same as those for IS and in EUROMOD they are used with the same name. This means that the ESA parameters cannot be changed separately from those of IS. When making policy changes, the user should consider whether this is what they intend. If not, they should add new variables to contain the ESA parameter values.

In reality ESA was introduced gradually from October 2008 and it is fully in place from 2014. It initially applied only to new claimants, while existent claimants still received IB and/or IS (see section 3.3 for more details). During the transition period nobody was supposed to lose from the change to ESA. To take this into account EUROMOD first computes IS/ib-JSA entitlement including entitlement on the basis of disability and then it 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 DLA), he/she is of working age and not in full time education or full-time work, and whether benefit unit's capital is less than 16,000 a year; if there is a partner EUROMOD checks also for his/her total hours of work being lower than 24 per week. Because income-based Employment and Support Allowance is payable instead of Income Support based on disability, EUROMOD assumes that

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[10] 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.

[11] From April 2017 new ESA claimants in the Work Relate Activities Group (WRAG) receive per week the same amount as jobseekers 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.

when somebody is entitled to both IS and ib-ESA, they will receive the higher amount so that no losses are introduced due to implementation assumptions.

EUROMOD notes: EUROMOD applies a take-up correction to this benefit by default. The take-up rate is assumed to be the same as for Income Support. See section 2.3 for more information.

- *Interactions with other simulated components of the tax benefit system*

IS/ib-JSA, Working Tax Credit and Contributory JSA are counted as income for ib-ESA purposes so they need to be simulated before IS/ib-JSA and ib-ESA. Because of non-dependent deductions and the fact that receipt of either IS/ib-JSA or ib-ESA acts as a passport to maximum HB and CTB, IS/ib-JSA and ib-ESA are simulated before HB and CTB.

Ib-ESA is not taxable.

2.5.9 Housing Benefit and Local Housing Allowance (*bho_s*)

Housing benefit (HB) and Local Housing Allowance (LHA) contribute to the cost of rent for low income families who are public sector tenants and private sector tenants, respectively. There are no conditions regarding working hours: the benefits cover those in work, pensioners, the unemployed, the disabled and the inactive. A number of elements are similar to IS/ ib-ISA such as the personal allowances, premiums and the inclusion of non-dependants in the calculations.

The main change introduced from April 2008 by the LHA is a limitation to the contribution toward the cost of rent for private sector tenants. This is achieved by:

o 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
o introducing a maximum level to the benefit for private tenants at the UK level by category of dwelling.

The policy was rolled-out between 2008 and 2013.

From April 2018 also Housing Benefit for social rent is capped by the relevant Local Reference rent.

- *Eligibility*

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

EUROMOD 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.

The calculation of the Housing Benefit and Local Housing Allowance amount is based on the 'applicable amount', the 'maximum HB/LHA' and the income of the claimant and their family (benefit) unit.

- *Benefit calculation*

The calculation of the Housing Benefit and Local Housing Allowance amount is based on the 'applicable amount', the 'maximum HB/LHA' and the income of the claimant and their family (benefit) unit.

'Applicable amount' (*i_bho_prelimAmt*)

The 'applicable amount' is calculated in a similar fashion to Income Support, income based JSA and ESA and Pension Credit, i.e. it consists of the personal allowances and premia. The rates for personal allowances (*i_bho_PersAllow*) and premia are mainly the same as for IS/ib_JSA for claimants under 60. Exceptions, and the rates and premia for those over pension aged are shown in in Table 21.

Table 21 Housing Benefit Allowances and premia (where different from those for IS) from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Family premium	17.45	17.45	17.45	17.45	17.8
Disability premium – child	60.06	60.90	62.86	64.19	65.49
Enhanced disability premium - child	24.43	24.78	25.48	26.04	26.57
Single pensioner between 60 and 64	155.60	159.35	163.00	167.25	170.64
Single pensioner 65 or over	168.70	172.55	176.4	181	184.67
Pensioner couple both between 60 and 64	237.55	243.25	248.80	255.25	260.42
Pensioner couple one or both 65 or over	252.30	258.15	263.80	270.6	276.09
Dependent children under 20	66.9	66.9	66.9	66.9	68.26

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20
Note: These allowances also apply to Council tax Benefit (see below).

'Maximum HB/LHA'

The 'maximum housing benefit' consists of 'eligible rent' minus deductions for non-dependents. 'Eligible rent' is the amount of rent paid as long as it is within the limits specified by the respective local authorities.

EUROMOD notes: In the implementation of EUROMOD we do not currently model 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 the Housing Benefit calculations.

From April 2008 HB for social tenants has been separated from LHA payable to private tenants. In 2009 LHA could include actual rent plus £15 per week if this was lower than the *median* (*50th percentile*) of local reference rent for accommodations with similar number of bedrooms (up to 5). The local reference rent is calculated for each Broad Rental Market Area (BRMA).

From 2011, for new claimants:

1. the dwelling categories were restricted to five: one-bedroom shared accommodation, one-bedroom self-contained accommodation, two-bedrooms, three-bedrooms and four or more bedrooms dwellings;
2. the local reference rent was lowered and set at the *30th percentile* of local rents within each BRMA, and;
3. the LHA for each category of dwelling was also capped at a national level maximum distinguishing by number of bedrooms, as shown in Table 22.

Table 22 Local Housing Allowance national rent limits, from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
One-bedroom shared accommodation	250.00	260.64	268.46	268.46	268.46
One-bedroom self-contained accommodation	250.00	260.64	268.46	268.46	268.46
Two-bedroom accommodation	290.00	302.33	311.40	311.40	311.40
Three-bedroom accommodation	340.00	354.46	365.09	365.09	365.09
Four + bedroom accommodation	400.00	417.02	429.53	429.53	429.53

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20 and https://www.gov.uk/housing-benefit/what-youll-get

From 2012, for all claimants:

1. the £15 per week addition was removed;
2. the local reference rent categories were restricted to 4 (the 5+ and 4 bedroom categories were amalgamated) plus the LHA for one-bedroom shared accommodation.

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

EUROMOD notes: FRS does not report BRMAs. See section 3 on how this upper limit has been taken into account through indicators that have been imputed and provided in the EUROMOD input data.

New claimants are identified based on how long they have been claiming HB (*bhomy*). Households who have claimed HB for less than a year (12 months) are considered new claimants and treated as described above. Households who have been on HB for more than a year are considered existing claimants.

Income of the claimant

The income assessment that is used is very similar to that for Income Support and income-based JSA. It also includes WTC (except the 30 hours element which is disregarded) and CTC. The earnings disregard (*ydg03_s*) for HB is the same as that for IS/ib-JSA except if the following conditions are met:

1. the claimant or partner receive the 30 hours element in WTC;
2. the claimant or partner are aged 25 or over and work 30+ hours;
3. the claimant or partner work 16 hours or more and the claim includes the family premium;
4. the claimant or the partner are working 16 hours or more and the HB claim includes the disability or higher pensioner premium.

In these instances, referred to as 'full-time' the earnings disregards (*i_bho_EligEarnsDisregard*) are topped up by £17.10. The earnings disregard for lone parents for the purposes of HB/LHA is £25.[12]

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[12] There is an additional condition which would result in an earnings disregard, namely getting the 50+ element in Working Tax Credit. However, as that has not been simulated, it is not included in the description.

There is 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*) up to £175 per week for one child and up to £300 for two or more children 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 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 aged people is treated as in Income Support, i.e. for every £250 over £6,000, £1 is counted towards the income of a claimant. For those of Pension Credit age £1 is deducted for every £500 capital over £10,000.

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 above), less non-dependent deductions. Non-dependent deductions work in the same way as for IS and ib_JSA and Pension Credit (see above).

For those with higher incomes (or not in receipt of IS for some reason), 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 bigger than the income, the 'maximum Housing Benefit' is tapered away at the rate of 65%.

EUROMOD Notes on implementation: While many of the parameters related to HB/LHA are the same as those for IS or Pension Credit (and also Council Tax Benefit – see below) in EUROMOD they are specified separately so that they can be varied if this is desired. When making policy changes, the user should consider whether the IS/PC and HB calculations should remain based on (largely) identical income and needs assessments.

EUROMOD applies a take-up correction to this benefit by default. See section 3.3.3 for more information.

- *Interactions with other simulated components of the tax benefit system*

Housing Benefit is simulated after tax credits and PC and IS and ib-ESA as the non-dependent deductions and means calculations require these other benefits to be simulated first. Housing Benefit (and LHA) is not taxable.

2.5.10   Universal Credit (*bsauc_s*)

Universal Credit (UC) is the newer social assistance benefit for working-age people on a low income who are in or out of work. It combines means-tested support for adults under pension age and children into one benefit. Universal Credit replaces most other ('legacy') means-tested benefits and tax credits and is a major reform now introduced nationwide for most new claimants from October 2013. In particular, UC replaces the following means-tested benefits and tax credits:

- Income Support (IS);
- Income-based Jobseeker's Allowance (Ib-JSA)
- Income-based Employment and Support Allowance (Ib-ESA)
- Housing Benefit (HB)
- Child Tax Credit (CTC)
- Working Tax Credit (WTC)

Universal Credit is paid monthly - or twice a month for some people in Scotland. It is a means-tested benefit for people of working-age who are on a low income. It is administered and paid by the *Department for Work and Pensions*.

A benefit cap may be applied if the total amount of certain benefits received exceeds a specified amount and the UC can consequently be reduced.

UC can be paid in addition to non-means-tested benefits such as Contribution-based JSA and Contribution-based ESA, but they count as income when UC is calculated (and the total amount considered for the benefit cap).

- *Eligibility*

Eligibility for Universal Credit is based on satisfy the **'basic conditions'** of being of working-age (over 18 and under the current female state pension age) and not being in education and the **'financial conditions'** of having low income and having savings and other capital under £16,000.

Exceptions to the basic conditions apply for 16-17 years old with limited capabilities for work or unable to 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 pension age *or* receiving education).

UC is not a contributory benefit and claimants do not need to have paid national insurance contributions to qualify.

EUROMOD notes: In EUROMOD-UK eligibility conditions are checked in various steps:

1) Step 1 identifies

   - Parents (*i_bsauc_elig1* =1)

   - Working-age individuals not in education OR in education but receiving some disability benefits (*i_bsauc_elig2*=1)

   - Exceptions: 16/17 years old with disability or parents; over female state pension age with a young partner (*i_bsauc_elig3*=1)

2) Step 2 combines the above conditions with financial condition (***i_bsauc_elig*** =1)

- *Income Test*

UC is a means-tested benefit. The amount of UC that can be received depends on the family's circumstances (see eligibility conditions above) and:

   o   the 'maximum amount' of UC - which is made up of a standard allowance and various elements - *and*
   o   the total amount of income and capital possessed.

EUROMOD notes: Before 16th of January 2019, if members of the benefit unit are severely disabled and are transferring from a 'legacy' means-tested benefit to UC, they would get allocated a 'transitional protection' payment (a top-up to ensure that the UC payment will not be less

than the legacy benefits payment). As the transition between legacy and Universal Credit system is randomly allocated, EUROMOD does not account for this payment.

- *Benefit amount*

The final amount of Universal Credit received is the results of the following five steps:

1. Calculate maximum amount (basic amount + premiums)

2. Workout earnings and check how much can be ignored

3. Workout other income and how much can be ignored

4. Calculate total income

5. Calculate UC entitlement

Maximum amount

The maximum amount is the figure representing weekly needs, e.g. the amount the claimant and her family are expected to live on each week. It results from the sum of:

- Standard allowance (different amounts for single and for couples, see Table 23 for specific amounts)
- + child element for each child, with an increase for disabled and severely disabled children (two-child limit applies here from April 2017)
- + limited capability for work element or work-related activity element (abolished for new claims after April 2017)
- + carer element
- + housing costs element (from April 2018 not covering mortgage)
- + childcare cost element

Table 23 presents the benefit's standard allowance and additional elements rates for fiscal years 2016/17 to 2020/21.

Table 23 Universal Credit standard allowance and additional elements rates (2016-2020)

As of… Fiscal year:	Jun-16 2016/17 £ /m	Jun-17 2017/18 £ /m	Jun-18 2018/19 £ /m	Jun-19 2019/20 £ /m	Jun-20 2020/21 £ /m
UC Standard allowance					
Single Claimant under 25	251.77	251.77	251.77	251.77	251.77
Single Claimant over 25	317.82	317.82	317.82	317.82	317.82
Joint Claimants (couples) both under 25	395.20	395.20	395.20	395.20	403.21
Joint claimants (couples) either over 25	498.89	498.89	498.89	498.89	509
UC Additional Elements					
Child element (per child/month up to 2) for children born:					
b. after 6/4/2017	*231.67*	*231.67*	*231.67*	*231.67*	*236.37*
b. before 6/4/2017	*277.08*	*277.08*	*277.08*	*277.08*	*277.08*

	As of…	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
	Fiscal year:	2016/17	2017/18	2018/19	2019/20	2020/21
		£ /m	£ /m	£ /m	£ /m	£ /m
Childcare costs element		85% of childcare costs				
1 child		*646.35*	*646.35*	*646.35*	*646.35*	*646.35*
2 children		*1,108.04*	*1,108.04*	*1,108.04*	*1,108.04*	*1,108.04*
Limited capability for work						
LCW element		*126.11*	*126.11[a]*	*126.11*	*126.11*	*128.67*
LCWRAG element		*315.60*	*318.76*	*328.32*	*336.20*	*343.02*
Carer's element		150.39	151.89	156.45	160.20	163.45
Disabled Child Addition						
Per child/m in receipt of DLA/PIP		*126.11*	*126.11*	*126.11*	*126.11*	*128.67*
Per child/m Severe Disability		*241.81*	*246.19*	*257.75*	*265.97*	*271.36*

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20 and https://www.gov.uk/benefit-cap .

Notes: [a] Abolished for new claimants from April 2017, but still available for older claimants.

Housing costs

Universal Credit is due to replace Housing Benefit and Local Housing Allowance for working age households. The Housing Element included into Universal Credit is calculated in a similar manner as for the old Housing Benefit and it is included in the calculation of the maximum UC amount.

Income assessment

One claim for UC is made per benefit unit and the entitlement depends on the income of all the members in the benefits unit as well as the composition of the household, i.e. whether there are adult-non-dependants present in the household. The income of other people in the household is not taken into account except via the non-dependent deduction (see below).
For the calculation of UC household income is distinguished into two categories:
1) Earned income
2) Unearned income.

In the calculation of what counts as income for Universal Credit, some earned income is ignored. This is known as the *work allowance* (ignored earned income):

Eligibility:
- People responsible for a child *OR*
- People with limited capability to work

Amount:
- Depends on whether UC includes housing costs element
- Earned income exceeding work allowance reduces UC maximum amount by 65p per extra £1 (taper 63% from 2017)
- Only one allowance applies per family

Income is defined by *il_UC_means_earned* and *il_UC_means_unearned*. The first includes net income from employment and self-employment and all other main current income sources **except** investment income and other benefits (Council Tax Reduction, Attendance Allowance and Disability Living Allowance). *Il_UC_means_unearned* includes all other main current

income sources such as Carer's Allowance, contributory JSA and ESA, pensions, property income, student loan, etc.

Some earnings and other income are disregarded (*ydg02_s*). These are £20 per week for a lone parent; £20 for a disabled person where disability is signalled by receipt of certain benefits (see above on entitlement to disability premium for legacy benefits) within the family unit; £10 for couples not qualifying on disability grounds and £5 for others. In addition, small amounts (£10) of war pension and maintenance payments are disregarded. Child benefit and Personal Independence Payments are completely disregarded, while occupational and personal pensions count in full. Income from investment income is not included directly in the UC family income assessment. Instead, a tariff income (£1 per week for every £250 capital) is calculated on financial capital between £6,000 and the upper threshold £16,000 (*yiviy02_s*).

Universal Credit `s allowance earnings disregards and capital limits (per week) are shown in Table 24.

Table 24 Universal Credit work allowance rates (2016-2020)

As of…	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Fiscal year:	2016/17	2017/18	2018/19	2019/20	2020/21
	£ /m	£ /m	£ /m	£ /m	£ /m
UC work allowance					
With help for housing costs	192.00	192.00	198.00	287.00	287.00
Without help housing costs	397.00	397.00	409.00	503.00	503.00
Income taper	65%	63%	63%	63%	63%
	£	£	£	£	£
Capital lower limit	6,000	6,000	6,000	6,000	6,000
Capital upper limit	16,000	16,000	16,000	16,000	16,000

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20 and https://www.gov.uk/benefit-cap .

Final award

The award is calculated by adding together the personal allowances, premia and disregards and then subtracting any income and non-dependent deductions. In practice, the final amount of Universal credit is calculated as follows:

UC final = UC max amount - unearned income - 65% * (earned income - work allowance)

- *Interaction with taxes and other benefits*

Claimants cannot get PC and UC at the same time. Single people must be under the qualifying age for PC (the same as the age at which state pension is received). Until 15th May 2019, couples with only one partner who has reached state pension age ('mixed-age couple') could choose between claiming UC and PC. From 15th 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 contribution-based JSA and contribution-based ESA, but they count as income when UC is calculated (and the total amount considered for the benefit cap).

<u>Transition from Legacy Benefits to Universal Credit</u>

As Universal Credit gets rolled out to all claimants by 2023, simulations of the 'legacy benefits' and the UC is done simultaneously, and claimants are allocated randomly to one of the two benefit system using DWP estimations and OBR forecasts from the latest Spring Statement (March 2019) as shown in the table below:

Table 25 – Transition between Legacy Benefits and Universal Credit

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
March 2019 OBR (n. of people)	0.00	0.07	0.31	0.53	1.15	2.32	3.30
$UCtransition (share of people)	0	0.01	0.05	0.09	0.2	0.41	0.58

Source: Office for Budget Responsibility (2019) Economic and Fiscal Outlook – March 2019: chart 4.3 page 103

Transferring process between legacy benefit system and UC system can be controlled by the user in two ways: 1) using the pre-set switches "*Legacy Benefits Assumption*" LBA_uk from the run window of EUROMOD. This has the effect of setting the parameter *$UCtransition* = 0. Alternatively, one can use the "*Universal Credit Assumption*" UCA_uk switch (setting it to *on*), which sets the parameter *$UCtransition* = 1 and assumes UC system is fully in place. 2) The user can also change the speed of transition between legacy benefits and Universal Credit by changing the specific values assigned to the parameter *$UCtransition.* Future improvements may account for the fact that roll-out might be different for different family types or different receivers of legacy benefits.

EUROMOD Notes: As Universal Credit gets rolled out to all claimants by 2023, simulations of the 'legacy benefits' and the UC are overestimated at times and underestimated for others. 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. Users should also note that Universal Credit Sanctions are not implemented in this release – these could further impact the total income received and the poverty rates estimated in this report.

The two-child limit introduced from April 2017 implemented in EUROMOD, assumes it applies to all families with children born after April 2017. In 2019 it applies to children 2 or younger, in 2020 it affects families with children 3 or younger and so on.

EUROMOD applies a take-up correction to this benefit by default. Universal Credit take-up is implemented maintaining consistency with individual behaviours under Legacy Benefits. That is: 1) Who takes-up legacy benefits, takes-up UC if eligible; 2) Who does not take-up legacy benefits, does not take-up UC even if eligible; 3) If not eligible for legacy benefits, but eligible to UC, EUROMOD applies probability of take-up as for Income Support distinguishing families with and without children. See section 3.3.3 for more information. This means that higher take-up rates and gains may arise for people who were not previously claiming all benefits they may have been entitled to.

2.5.11   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

considerably between areas. The structure of Council Tax Benefit (CTB) is very similar to that of Housing Benefit. Instead of rent, Council Tax is the element that is rebated. In addition to CTB, there are a number of other reductions to Council Tax that are not simulated and are already incorporated in the Council Tax data in the database. These are: exemptions for particular groups of people, i.e. specified type of impairment or disability as well as a reduction of 25% if the dwelling is occupied by a single adult.

There are in fact two alternative forms of CTB. 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 allowable even when the capital limit is exceeded and is payable when there is more than one adult but only one non-exempt adult.

EUROMOD notes: In most cases the main CTB is worth more, so EUROMOD ignores SAR cases and does not model them.

From 2013 Council Tax benefit has been made the responsibility of individual local authorities. It is therefore likely that as time goes by the nature of the scheme will vary considerably across local area and may not operate at all in some. In particular, Scotland and Wales maintained the 2012 national scheme with parameters uprated in line with those for IS and HB. In England we currently assume that the 2012 national scheme continues to apply in 2013 and following years, with parameters uprated in line with those for IS and HB. Because of the reduced local authorities' budget for the benefit, we assume a general reduction of 10.6%.

- *Benefit Amount*

CTB is calculated in the same way as HB except: the taper is 20% and the non-dependent deductions are different (shown in Table 26).

Table 26 Non-dependent deductions for Council Tax benefit from 2016 to 2020

| As of… | Jun-16 | Jun-17 | Jun-18 | Jun-19 | Jun-20 |
| Fiscal year: | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
	£ per week	£ per week	£ per week	£ per week	£ per week
Deduction applying if	10.52	10.64	10.82	11.02	11.24
income is above	418.5	423.52	430.72	438.48	447.37
Deduction applying if	8.78	8.87	9.02	9.18	9.37
income is above	335.65	339.68	345.45	351.67	358.8
Deduction applying if	6.96	7.04	7.16	7.29	7.44
income is above	194.38	196.71	200.06	203.66	207.79
Deduction otherwise	3.51	3.55	3.61	3.67	3.74

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20. Parameters for 2013/14 onward are imputed based on those for Income Support and Housing benefit (see text).

EUROMOD notes: The parameter sheets for IS, HB and CTB are independently specified. When making policy changes, the user should consider whether the three sets of calculations should remain based on (largely) identical income and needs assessments. EUROMOD applies a take-up correction to this benefit by default. See section 3.3.3 for more information.

2.5.12 Benefit Cap (*brd_s* and *brduc_s*)

From 15 April 2013, a "benefit cap" may limit the total amount payable to a benefit unit from certain specific benefits. The benefit cap is applied by reducing Housing Benefit (HB) (or

Universal Credit (UC) after October 2013). 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:

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

Exceptions for which the benefit cap does not apply when applied through HB:

1. Benefit unit receiving Working Tax Credit or earning more than a minimum amount (the equivalent of 16 hours of work at the National Living Wage) if receiving UC;
2. Benefit unit not receiving IS, ib-JSA or ib-ESA;
3. 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 IS, JSA or ESA;
4. People entitled to any of the following disability benefits: the ESA support component, people receiving attendance allowance, disability living allowance (or PIP), industrial injuries disablement benefit, reduced earnings allowance or retirement allowance, war pension.

- *Specified benefits to which the cap applies*

If the cap is applied through HB: the specified benefits to be capped are: IS, JSA, ESA (if neither the claimant or his/her partner are in the support group), HB, bereavement allowance, carer's allowance, child benefit, guardian's allowance, CTC, incapacity benefit, maternity allowance, severe disability allowance, widowed allowance, widow's pension.

- *Amount*

The cap applies when yearly entitlement to certain specified benefits exceeds a threshold of £26,000 a year for couples and lone parents or £18,200 a year for singles. From 2017 different caps apply to London and out of London areas (see below).

Table 27 Benefit cap rates from 2016 to 2020

As of…	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Fiscal year:	2016/17	2017/18	2018/19	2019/20	2020/21
	£ per week	£ per week	£ per week	£ per week	£ per week
Greater London:					
Couples (with and without children) and single with children	26,000	23,000	23,000	23,000	23,466
Single without children	18,200	15,410	15,410	15,410	15,722
Rest of the UK:					
Couples (with and without children) and single with children	26,000	20,000	20,000	20,000	20,405
Single without children	18,200	13,400	13,400	13,400	13,672
Min Earnings	430	520	542	569	604

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20 and https://www.gov.uk/benefit-cap .

EUROMOD notes: In EUROMOD the benefit cap is not implemented as a reduction to HB (or UC). The variable *brd_s* is subtracted from the means-tested income list (*ils_benmt*) directly.

2.5.13 Maternity Allowance (*bmana, bmanc_s*)

This is a non means-tested benefit paid weekly for pregnant women and new mothers who cannot claim Statutory Maternity Pay. It is intended to help women taking time off work both before and after the date the baby is due.

- *Definitions*

A fixed amount is paid to pregnant women or new mothers either for 39 weeks or 14 weeks depending on eligibility.

- *Eligibility conditions*

    1. Pregnant women or new mothers, and:
    2. Not eligible for Statutory Maternity Pay.

The benefit is paid for 39 weeks to women who in the 66 weeks before the baby is born, have been:
- employed for at least 26 weeks or
- self-employed and have paid National Insurance Contributions (Class 2) for at least 26 weeks (not necessarily consecutive);
- earning (or classed as earning) £30 a week or more in at least 13 weeks out of the 26 weeks - the weeks do not have to be consecutive.

Women can still qualify if they have recently stopped working. It does not matter if they had different jobs or periods of unemployment.

The benefit is paid for 14 weeks to women who in the 66 weeks before the baby is born, have been:
- not employed or self-employed, but
- who provided unpaid helped to spouse or partner in their self-employed business and
- spouse or partner pays Class 2 National Insurance contributions.

- *Income test*

No.

- *Benefit duration*

Duration of the benefit can be either 39 weeks or 14 weeks. This period 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.

- *Benefit amount*

The amount equals either 90% of the average weekly earnings or £139.58 a week, whichever is less. For people qualifying because they help with their spouse's self-employment, MA is only payable during the 14-week qualifying period. The amount received is £27 a week.

The benefit amounts by duration for the Maternity Allowance over the policy years are laid out in the Table below.

Table 28 Maternity Allowance amounts by duration conditions 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17	Jun-17 2017/18	Jun-18 2018/19	Jun-19 2019/20	Jun-20 2020/21
	£ per week	£ per week	£ per week	£ per week	£ per week
% of average weekly earnings	90%	90%	90%	90%	90%
Maximum amount for employees for - 39 weeks	139.58	140.98	145.18	148.68	151.65
- Amount payable to self-employed who do not fulfilled the NIC requirement (39 weeks)	27	27	27	27	27
Non-working people helping in partner's self-employment business	27	27	27	27	27

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20

- *Interactions with other benefits and taxes/SIC*

The Maternity Allowance is not taxable. It does not affect entitlement to tax credits but it may affect the amount of other benefits such as: Council Tax Reduction, Housing Benefit, Employment and Support Allowance (ESA), Income Support, Jobseeker's Allowance (JSA), bereavement benefits, Carer's Allowance, Universal Credit. Maternity allowance is limited by the benefit cap when received in combination with Housing benefit or Universal Credit.

- *Take up*

Nearly all mothers take maternity leave.

2.5.14 Statutory Maternity Pay (SMP) (*bmaer, bmact_s*)

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

- *Definitions*

This is a benefit to all parents who personally provide full-time care for a small child up to 4 years of age. It has a contributory and non-contributory part. The amount of contributory benefit is proportional to earnings of one of the parents (whoseever earnings are higher). There is also a non-contributory benefit for families for parents who have acquired contributions.

- *Eligibility conditions*

There are two basic rules to qualify for SMP:

1. the 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 1 day employment in the qualifying week. However, there are some circumstances when breaks in employment can be disregarded.

2. the earnings rule: average gross weekly earnings must be at least equal to the lower earnings limit (LEL) for National Insurance (NI) purposes. The lower earnings limit is the point at which one starts to be treated as if she has paid NI contributions (although she will not actually have to pay NI contributions until her earnings reach a higher point called the primary earnings threshold (PT).

- *Income test*

Not applicable for this benefit.

- *Benefit duration*

SMP can be paid for a maximum period of 39 weeks. 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 the 11th week before the week the baby is due, she can chose the day she wants SMP to start.

The qualifying week is the 15th week before the week in which 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.

- *Benefit amount*

The amount of SMP depends on how much the recipient earns. The first 6 weeks of SMP are earnings related and the mother will get a weekly rate equal to 90% of her average weekly earnings (there is no upper limit). The remaining 33 weeks are paid at the weekly standard rate SMP of £139.58 (from 5 April 2015) or the earnings-related rate (90% of her average weekly earnings) if this is less than standard rate SMP.

No additional SMP is payable for multiple births or adoptions.

Table 29 Lower Earnings Limits for National Insurance contributions from 2015-2019

| | As of… | Jun-16 | Jun-17 | Jun-18 | Jun-19 | Jun-20 |
	Fiscal year:	2016/17	2017/18	2018/19	2019/20	2019/20
Lower Earnings Limit (LEL) (£ per week)		112	113	116	118	120
SMP amount as % of earnings		90%	90%	90%	90%	90%
SMP weekly standard rate		139.58	140.98	145.18	148.68	151.65

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2016/17 to 2019/20. HMRC: Rates and Allowances – National Insurance Contributions, http://www.hmrc.gov.uk/rates/nic.htm

- *Subject to taxes/SIC*

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

EUROMOD notes: In EUROMOD the benefit duration is modelled as being received 11 weeks before birth and 28 weeks after birth.

2.5.15 Statutory Paternity Pay (*bpact_s*)

- *Definitions*

A child's male legal guardian is entitled to <u>2 weeks paid leave after birth</u> of child. Paternity leave can be taken within 56 days (8 weeks) of the actual date of birth of the child, or if the child is born early, within the period from the actual date of birth up to 56 days after the first day of the week in which the birth was expected.

- *Eligibility conditions*

Continuously employed by the same employer for at least 26 weeks ending with the week in which they notified adoption of child or week ending with 15th week before the baby is due and earns at least the lower earnings limit (LEL) for National Insurance (NI) purposes.

- *Income test*

Not applicable for this benefit.

- *Benefit duration*

2 weeks

- *Benefit amount*

Same as for statutory maternity pay: SMP weekly standard rate or 90% of a person's average earnings if less than SMP weekly standard rate.

- *Subject to taxes/SIC*

Subject to taxation. Standard taxation rules apply.

2.5.16 Sure Start Maternity Grant (*bmamt_s*)

- *Definitions*

The Sure Start Maternity Grant is a one-off payment to help towards the costs of having a child.

- *Eligibility conditions*

Usually a woman qualifies for the grant if all of the following apply:

- She is expecting her first child, or she is expecting a multiple birth (such as twins) and has children already
- She or her partner already receives at least one of the following benefits: Income Support, income-based Jobseeker's Allowance, income-related Employment and Support Allowance, Pension Credit, Child Tax Credit, Working Tax Credit that includes a disability or severe disability element, Universal Credit.
- She must claim the grant within 11 weeks of the baby's due date or within 6 months after the baby's birth.

- *Income test*

Not applicable for this benefit.

- *Benefit amount*

The amount a one-off payment of £500.

- *Subject to taxes/SIC*

Sure Start Maternity Grant is not taxable and it is disregarded as income or capital for means-tested benefits or tax credits; and does not affect entitlement to any non-means-tested benefits. Sure Start Maternity Grants payment is not affected by the benefit cap.

EUROMOD notes: In Scotland, from late 2018 the Sure Maternity Grant has been replaced (and will be extended) by the Best Start Grant (see below).

2.5.17   Best Start Grant (*bmascmt_s*)

The Best Start Grant 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 of £600 for a first child or £300 for a second or subsequent child. It is 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 of £250 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 of £250 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*

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. Eligibility depends on the date of birth of the child (see table below):

Table 30 Best Start Grant Eligibility criteria – baby age

As of…	Jun-19	Jun-20
Fiscal year:	2019/20	2020/21
Child's date of birth	March 2014 -Feb 2015	Mar 2015 – Feb 2016
Child age	4.3 - 5.3 y.o.	4.3 – 5.3 y.o.

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2018/19 to 2019/2020.

- *Income test*

There is no income test for these benefits, but people can apply if they are receiving one of the following means-tested benefits:

- Child Tax Credit
- Universal Credit
- Income Support
- Pension Credit
- Working Tax Credit
- Housing Benefit
- Income-based Jobseekers Allowance (JSA), not 'contribution based' JSA
- Income-related Employment and Support Allowance (ESA), not 'contribution based' ESA

- *Benefit duration*

One off payment.

- *Benefit amount*

The benefit amount is outlined in Table 31.

Table 31 Best Start Grant amounts from 2015-2019

	As of… Fiscal year:	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
Pregnancy and Baby payment			
First child		600	600
Other children		300	300
Early learning payment		250	250
School age payment		250	250

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2019/20

- *Subject to taxes/SIC*

Best Start Grants are not taxable. They are not counted as income or capital for means-tested benefits or tax credits. The best Start Grants payments are not affected by the benefit cap.

2.6   Social contributions

2.6.1   Employee social insurance contributions (*tscee_s*)

- *Liability for contributions*

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

- *Income base used to calculate contributions*

The amount of so-called National Insurance contributions depend on weekly earnings from employment (*yem*) as well as earnings replacement benefits paid by the employer, namely, Statutory Sick Pay (*bhlwk*) and Statutory Maternity Pay (*bmana*).

Contributions are paid on earnings between a weekly lower limit, called the Primary Threshold (PT) and Upper Earnings Limit (UEL). Earnings above the UEL are subject to a lower rate (*i_NIclass1_empl_aboveUEL*).

- *Rates and thresholds*

The rate applying to earnings between PT and UEL varies according to whether or not the employee is contracted-out of the State-Earnings-Related-Pension-Scheme (*lim*=0). If so the rate paid is lower. Table 32 shows the thresholds (gross earnings limits) and rates.[13]

From April 2016 contracted-out employees pay the standard rate of National Insurance contributions and no longer get the 1.4% National Insurance rebate.

Table 32 Gross earnings limits and rates for Class 1 (employee) National Insurance Contributions 2016 to 2020

	As of… Fiscal year:	Jun-16 2016/17 £ per week	Jun-17 2017/18 £ per week	Jun-18 2018/19 £ per week	Jun-19 2019/20 £ per week	Jun-20 2020/21 £ per week
Gross earnings limits:						
Primary Threshold (PT)		155	157	162	166	170
Upper Earnings Limit (UEL)		827	866	892	962	861.54
Rates:						
Between PT and UEL:						
Non contracted out		*12%*	*12%*	*12%*	*12%*	*12%*
Contracted out		*12%*	*12%*	*12%*	*12%*	*12%*
Above UEL		2%	2%	2%	2%	2%

Source: HMRC: Rates and Allowances – National Insurance Contributions, http://www.hmrc.gov.uk/rates/nic.htm

EUROMOD notes: Whether the employee is contracted out or not is not observed as such in the data; this variable has been imputed, according to reported earnings and amount of contribution.

- *Compulsory private pension contributions*

For those who are contracted out of the state pension scheme, the rate of their occupational private pension contribution is imputed as a flat rate in the input data (*tpceepx= yem*/*contributions*). The rate is then applied to uprated (or otherwise adjusted) earnings in EUROMOD and the resulting private contribution (*tpcee_s*) is, by default, included within the

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[13] 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.

employees social insurance contribution (in EUROMOD the standard output income list *ils_sicee*).

2.6.2 Self-employed social insurance contributions, Class 2 and Class 4 (*tscse_s*)

- *Liability for contributions*

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

- *Rates and thresholds*

Class 2 is a flat weekly amount paid by those whose yearly profit/self-employment income (*yse*) exceeds the so-called 'Small Earnings Exception' – see Table 33 for the amounts and level of the exception.

Table 33 Rates for self-employment Class 2 National Insurance contributions, 2016-2020

As of… Fiscal year:	Jun-16 2016/17	Jun-17 2017/18	Jun-18 2018/19	Jun-19 2019/20	Jun-20 2020/21
Flat rate (£ per week)	2.8	2.85	2.95	3	3.05
Small Earnings Exception (£ per year)	5,965	6,025	6,205	6,365	6,495

Source: HMRC: Rates and Allowances – National Insurance Contributions, http://www.hmrc.gov.uk/rates/nic.htm

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*) – see Table 34.

Table 34 Upper and Lower Profit Limits for self-employment Class 4 National Insurance contributions from 2016-2020

As of… Fiscal year:	Jun-16 2016/17	Jun-17 2017/18	Jun-18 2018/19	Jun-19 2019/20	Jun-20 2020/21
Lower Profits Limit(LPL) (£ per year)	8,060	8,164	8,424	8,632	8,808
Upper Profits Limit(UPL) (£ per year)	43,000	45,000	46,350	50,000	50,000
Rate between LPL and UPL	9%	9%	9%	9%	9%
Rate above UPL	2%	2%	2%	2%	2%

Source: HMRC: Rates and Allowances – National Insurance Contributions, http://www.hmrc.gov.uk/rates/nic.htm

Maximum contributions for those with income from self-employment and from employment

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 Class 2 and Class 4 NICs maximum is calculated by taking the maximum amount of Class 4 NICs payable on profits between the UPL and the LPL and adding 53

times the weekly Class 2 NICs at the rate in force for the year in question (*i_combined_bwLPLandUPL*);

2.   Then, from that combined figure any Class 1 and Class 2 NICs that have been paid are deducted (*i_combined_net*);

3.   This gives the maximum amount of Class 4 NICs that the contributor is liable to pay at the main rate (*i_selfempl_income_bwLPLandUPL*);

4.   Then the amount of profits that would be needed to pay that amount of Class 4 NICs is calculated and this is deducted from the contributor's total profits;

5.   If that figure is positive it represents the amount of profits on which Class 4 NICs at 2% are payable (*i_selfempl_income_addrate*).

The calculation then allocates every Class 4 NICs contributor who is subject to a Class 4 NICs annual maximum into one of three categories:

1.   those who are due to pay:

   o   Class 4 NICs at a rate of 9 % only (*i_NI2class4_selfempl_aboveLPL*)

2.   those who are due to pay:

   o   a mixture of Class 4 NICs at rate of 9% and 1% (*i_NI1class4_selfempl_addrate*) and

3.   those who are due to pay:

   o   Class 4 NICs at a rate of 1% only
       (above the UEL = *i_NI3class4_selfempl_aboveUPL* and below the UEL = *i_NI3class4_selfempl_belowUPL*).

The final calculation for National Insurance contributions on income from self-employment then adds Class 2 and Class 4 contributions together (*tscse_s*).

2.6.3   Employers' social insurance contributions (*tscer_s*)

- *Liability for contributions*

Employers have to pay secondary Class 1 National Insurance contributions for each of their employees if their earnings are above the Secondary Threshold and if the employees are aged 16 years or older.

- *Thresholds and rates*

Contributions are paid on all earnings above the 'Secondary Threshold'. The rate on earnings above the Upper Earnings Limit (UEL), which is the same as that for Class 1 employee contributions, is the same rate for all employees. Between the Secondary Threshold and the UEL it is lower for contracted-out employees' earnings (*lim*=2) before April 2016. There is no upper ceiling on contributions from employers.

Table 35 shows the thresholds and rates of employers` social insurance contributions.

Table 35 Thresholds and rates of employers' social insurance contributions 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17	Jun-17 2017/18	Jun-18 2018/19	Jun-19 2019/20	Jun-20 2020/21
Secondary Threshold (ST) £/week	156	157	162	166	171
Non contracted out rate above ST	13.8%	13.8%	13.8%	13.8%	13.8%
Contracted out rate between ST and UEL	13.8%	13.8%	13.8%	13.8%	13.8%
Contracted out rate above UEL	13.8%	13.8%	13.8%	13.8%	13.8%

Source: HMRC: Rates and Allowances – National Insurance Contributions,
http://www.hmrc.gov.uk/rates/nic.htm

2.7 Personal Income Tax (*tin_s*)

2.7.1 Tax Unit

The UK income tax system is an individual system. The incomes of each member of a married couple are taxed independently. Two exceptions have been introduced: in 2013, the "high-income child benefit charge" for which individual and partner's incomes are taken into account together in order to determine liability (see section 2.5.4 for more details); in 2015, the "transferable personal tax allowance for married couples" (see 2.7.5) which allows a spouse or civil partner who is not liable to income tax above the basic rate to transfer up to £1,000 of their unused personal allowance to their spouse or civil partner, provided that the recipient of the transfer is also not liable to income tax above the basic rate.

2.7.2 Exemptions

The following income sources are non-taxable: Disability Living Allowance, Attendance Allowance, lump sum Bereavement Payments, Pension Credit, Winter Fuel Allowance, Housing Benefit, income base Employment and Support Allowance, Child Benefit (see section 2.5.4. for exceptions), Guardian's Allowance, Statutory Maternity pay, Industrial Injuries Benefit, Severe Disability Allowance, War widow's pension, Council Tax Benefit, Income Support, Child and Working tax credits, maintenance payment, student payments and loans, and training allowance.

2.7.3 Tax allowances (*tinta_s*)

There is a basic tax free **Personal Allowance** (*i_tinta_PersAllow*).[14] There are also additional "**Age allowances**" for older individuals which are income-tested. Thus, if an older taxpayer has annual taxable income over a threshold (£27,000 in 2014) the additional age-related allowance is reduced using a 50% taper until the level of the standard Personal Allowance is reached (*i_tinta_IncExcess1*) – see Table 36.

From 2013 the age allowances will be phased out by restricting them to existing beneficiaries by increasing the age thresholds by one year each year.

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[14] There is an allowance for blind people. However, this is not simulated here due to lack of information in the input data.

From 2010 an **income limit** for personal allowances was introduced. For each £2 of taxable income above £100,000 the personal allowance is reduced by £1 until the entire personal allowance is abated to zero.

The "married couple's age allowance" is also included in the income testing and abatement referred to above. However, as this is strictly a tax credit it is described in section 2.7.7 below.

Table 36 Tax allowances 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per year	Jun-17 2017/18 £ per year	Jun-18 2018/19 £ per year	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
Personal Allowance					
under X years old	11,000	11,500	11,850	12,500	12,500
X-Y years old	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Y years old or over[a]	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
X	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Y	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Income limit for age-related allowances	27,700	*n/a*	*n/a*	*n/a*	*n/a*
Income limit for personal allowances	100,000	100,000	100,000	100,000	100,000

Source: HMRC: Rates and Allowances – Income Tax,
http://www.hmrc.gov.uk/stats/tax_structure/table-a2a.pdf

Notes: [a] In 2016/17 personal tax allowance becomes the same for all age groups. HMRC 2015, http://www.hmrc.gov.uk/rates/it.htm.

2.7.4 Personal Saving Allowance (*tinsa_s*)

From 2016 a new **Personal Saving Allowance** (*tinsa_s*) has been introduced. The amount depends on the amount of taxable income: basic rate taxpayers will be able to earn up to £1,000 per year in savings income tax-free before paying tax on savings, higher rate taxpayers will be able to earn up to £500 per year. No personal saving allowance is available for taxpayers paying additional tax rate (income band over £150,000). Tax-free products (i.e Individual Saving accounts (ISA) or National & Saving Investments (N&SI)) do not count toward personal saving allowance.

Table 37 Personal Saving Tax allowances from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per year	Jun-17 2017/18 £ per year	Jun-18 2018/19 £ per year	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
Personal Saving Allowance					
Basic taxpayers	1,000	1,000	1,000	1,000	1,030
Higher taxpayers	500	500	500	500	520
Additional taxpayers	n/a	n/a	n/a	n/a	n/a

Source: HMRC: Rates and Allowances – Income Tax,
http://www.hmrc.gov.uk/stats/tax_structure/table-a2a.pdf

2.7.5   Transferable tax allowance

From April 2015 married and civil couples where one partner earns less than the £11,000 income tax personal allowance will be able to transfer part of their unused allowance to their partner up to a limit of £1,100 (10% of the personal tax allowance in 2015).

Eligible couples are those where both partners were born on or after 6 April 1935 (so it includes some pensioners) and the recipient partner does not pay tax at higher tax rate (40%) or additional tax rate (45%) (in other words his/her annual income lies between £10,601 and £42,385 during the 2015/16 tax year).

Table 38 Transferable personal tax allowances for married couples from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per year	Jun-17 2017/18 £ per year	Jun-18 2018/19 £ per year	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
Transferable Personal Allowance					
Annual amount	1,100	1,150	1,185	1,250	1,250

2.7.6   Tax base

Taxable income (*il_tinty*) includes:

- Earnings from employment and benefits from employer (*yem + bmana+ bhlwk*);
- Earnings from self-employment (*yse*);
- State, occupational, personal pensions and widow pension (*boact00 + boactcm + ypp + bsuwd*);
- Carer's allowance (*bcrdi*);
- Incapacity benefit[15] (*bdict01*);
- Contributory ESA (*bdict02*);
- Contributory JSA (*bunct_s*);
- Rental income from a second property or over certain limits (*yprtx*);
- Interests and dividends (except from Individual Savings Accounts (ISAs) and Personal Equity Plans (PEPs)) (*yiytx*);
- Other income (from odd jobs) (*yot01*)

Contributions to personal (*xpp*), private and occupational pensions (*tpcpe*) are deducted from the tax base.

Losses from self-employment can be offset against other taxable income (or carried forward, or used against previous year income). For simulation purposes we assume they are only offset against other taxable income of the same year.

2.7.7   Tax schedule

The main tax thresholds and rates are set out in Table 39.

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[15] According to the legislation, IB is taxed only after the first 28 weeks of payment; we assume that receipt has lasted this long, as information of length of IB award is not available in the data at hand.

Table 39 Income tax thresholds and rates from 2016 to 2020

As of… Fiscal year:	Jun-16 2016/17 £ per year	Jun-17 2017/18 £ per year	Jun-18 2018/19 £ per year	Jun-19 2019/20 £ per year	Jun-20 2020/21 £ per year
Savings rate threshold	5,000	5,000	5,000	5,000	5,160
Starter rate threshold in Scotland			2,000	2,049	2,049
Basic rate threshold in Scotland	32,000	31,500	12,150	12,444	12,444
Basic rate threshold rUK	32,000	33,500	34,500	37,500	37,500
Intermediate rate threshold in Scotland			31,580	30,930	30,930
Higher rate threshold	150,000	150,000	150,000	150,000	150,000
Savings rate %	0	0	0	0	0
Starter rate % in Scotland			19	19	19
Basic rate %	20	20	20	20	20
Intermediate rate % in Scotland			21	21	21
Higher rate % rUK	40	40	40	40	40
Higher rate % in Scotland			41%	41%	41%
Additional rate % rUK	45	45	45	45	45
Additional rate % in Scotland			46	46	46

Source: HMRC: Rates and Allowances – Income Tax,
http://www.hmrc.gov.uk/stats/tax_structure/table-a2a.pdf

The savings rate of 10% only applies to income from investments (*yiytx*). Before 2015, this could happen only if, without the investment income, taxable income is less than the savings rate threshold (e.g. £2,880 in 2014). In that case, the tax system treated the savings income as the "top slice" and applied the lower rate of 10% to any excess of the threshold over non-savings taxable income (or to the savings income itself, if this was lower). From 2015 the saving rate of 10% has been abolished and the threshold increased, so that income from investments lower than £5,000 is free of tax, while any excess over the threshold is taxed together with the remaining taxable income.

From April 2016 Scotland can regulate part of income tax for Scottish resident. While in 2016/17 no changes were introduced, from 2017/18 Scottish residents face a lower basic rate threshold and from 2018/19 Scotland increased the number of tax bands.

2.7.8 Tax credits

The Working Tax Credit and Child Tax Credit are considered as benefits by EUROMOD and are described in the section on benefits, above.

There is a residual tax credit for older couples. Although the Married Couples' Allowance (and Additional Personal Allowances for lone parents) were abolished in 2001, for taxpayer couples where one or both is aged over 65 a residual allowance has been retained in the form of a non-refundable tax credit. This residual **Married Couples Allowance (MCA)** applies to couples (married or living together in a civil partnership; *dms*=2) where one partner was born before

April 1935 (i.e. aged 79 years old or over in 2014) (*i_tin_prelimMCA*). The MCA can be claimed by the husband if the couple married before 2005 (otherwise by partner with highest income);[16] any unused allowance can then be transferred to the spouse or civil partner (*i_tin_unusedMCA*).

Along with the addition to the personal allowance for older people, fifty per cent of the difference between taxable income (before deducting allowances) and the income limit is subtracted from the MCA, down to a minimum level. This minimum is the value of the MCA for couples aged under 65 as it was before it was abolished in 2001, indexed by prices. 10% of such amount represents the MCA tax credit (*i_tin_finalMCA*). MCA levels for the relevant policy years are listed in Table 40.

Table 40 Tax credits from 2016 to 2020

| | As of… | Jun-16 | Jun-17 | Jun-18 | Jun-19 | Jun-20 |
| | Fiscal year: | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
		£ per year	£ per year	£ per year	£ per year	£ per year
MCA		8,355	8,445	8,695	8,915	9,180
Lower age limit for MCA		75	75	75	75	75
Minimum MCA		3,220	3,260	3,360	3,450	3,560
Income limit for age-related allowances		27,700	*n/a*	*n/a*	*n/a*	*n/a*
Tax relief rate for the MCA		10%	10%	10%	10%	10%

Source: HMRC: Rates and Allowances – Income Tax
https://www.gov.uk/government/publications/rates-and-allowances-income-tax/income-tax-rates-and-allowances-current-and-past#personal-allowances

2.8   Changes to non-simulated instruments (if applicable)

The following non-simulated instruments have been changed from 2013:

Disability Living Allowance (DLA). DLA could be claimed by individuals if they became disabled before the state pension age and had personal care and/or mobility needs. DLA for working-age people will be fully replaced by the Personal Independent Payment (PIP) by 2018. In order to take into account the lower entitlement, policy *bdisc_uk* randomly sets the DLA personal care component (*bdisc*) to zero for 20% of individuals receiving lowest or middle rate allowance for datasets that do not record PIP benefits. This reduction does not apply when using FRS 2014/15 - or any following version - as the reduction described above is observed in the survey.

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[16] EUROMOD assumes that the MCA is claimed by the husband in all cases.

3. DATA

3.1 General description

The UK database is drawn from the Family Resources Survey (FRS). Specifically, for this year there are two new EUROMOD input datasets generated respectively from FRS 2016/17 and 2017/18.[17] 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 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 1991 Census of Population. In a second stage a random sample of 25 addresses is drawn within each Primary Sampling Unit (PSU) and represents an interviewer's monthly assignment.

The Northern Ireland 2016/17 and 2017/18 sample frame is the Valuation and Land Agency's list of domestic properties and follows an unclustered, regionally 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.[18] 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 are required to try a minimum of four calls per households. 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 one hour and 20 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. Where possible, questions are harmonised to maximise comparability with other surveys.[19] 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.

Several adjustment procedures take place after the data collection, including taking into account interviewers' notes, checking fixed-amounts benefits, disentangling multiple benefit receipts, investigating outliers and zero amounts. Item non–response mostly relates to self-employment

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[17] See https://www.gov.uk/government/statistics/family-resources-survey-financial-year-201617 and https://www.gov.uk/government/statistics/family-resources-survey-financial-year-201718 .
From 2013 to 2016 the EU-SILC for the UK has been based on the FRS.

[18] 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.

[19] http://www.statistics.gov.uk/about/data/harmonisation/default.asp

and investment income and is limited to 0.5% of all responses. The EUROMOD database makes use of the imputed data.

Table 41 EUROMOD databases description

EUROMOD database	UK_2016_a1	UK_2017_a1
Original name	Family Resources Survey	Family Resources Survey
Provider	Department for Work and Pensions	Department for Work and Pensions
Year of collection	2016/17	2017/18
Period of collection	April 2016 – March 2017	April 2017 – March 2018
Income reference period	Current year incomes	
Sampling	Stratified clustered probability sample for Great Britain and unclustered, regionally stratified design for Northern Ireland	
Coverage	Residents in private households	
Achieved sample	44,145 individuals	42,847 individuals
Response rate	54%	52%

Source: DWP, Family Resources Survey 2016/17 and 2017/18
https://www.gov.uk/government/statistics/family-resources-survey-financial-year-201617 and
https://www.gov.uk/government/statistics/family-resources-survey-financial-year-201718

3.2 Sample quality and weights

3.2.1 Non-response

In 2016/17, 54% of the 35,803 sampled households provided full cooperation[20] with regional variation in response rates reflecting patterns found in other major surveys. In 2016/17, for those households classed as fully co-operating, proxy responses were obtained for 22 per cent of adults. In 2017/18, 52% of the 37,129 sampled households provided full cooperation and proxy responses were obtained for 22% of adults.

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[20] Individual full cooperation requires less than 13 "don't know" or "refusal" answers to monetary amount questions out of approx. 50 questions.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/437481/family-resources-survey-2013-14.pdf

Table 42 Household response rates in the FRS 2016/17 and 2017/18 by government office regions

Region/Country	Share of households	
	2016/17	2017/18
United Kingdom	54	52
England	54	52
Wales	57	55
Scotland	51	49
Northern Ireland	58	55
North East	60	57
North West	57	55
Yorkshire and the Humber	56	56
East Midlands	58	53
West Midlands	57	53
East	54	53
London	46	44
South East	52	49
South West	54	52

Source: DWP, Family Resources Survey 2016/17 (Table M.2 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/692128/frs-methodology-and-standard-error-data-tables-2016-17.xlsx) and 2017/18 (Table M2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/789449/frs-methodology-and-standard-error-tables-2017-18.xlsx)

Lower response rates than the average were seen in households in London, South East, and in Scotland (as shown in Table 42), single person households, households containing couples with non-dependent children or lone parents, households in purpose-built flats or maisonettes, households who owned their house outright, and households whose household responsible persons (HRP) was self-employed or unemployed. In contrast, higher response rates occur, for example, in households with dependent children.

3.2.2 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 2016/17 and 2017/18 are based on population totals by gender 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[21], 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 gender and age group (NISRA[22]), number of lone parents and households (Northern Ireland Department for Social Development estimates).[23]

Table 43 Descriptive Statistics of the Grossing-up weight (*dwt*)

	UK_2016_a2	UK_2017_a1
Number	44,145	42,847
Mean	1,459.305	1,508.655
SD	865.9325	884.4755
Maximum	39,675	30003
Minimum	221	274
Max/Min	179.52	109.5

For 2016/17 and 2017/18, no households have been dropped from the sample. For 2016/17, the original sample size includes 44,145 individuals and 19,380 households, whereas for 2017/18 sample size includes 42,847 individuals and 19,105 households. Applying weights included in the dataset to gross the numbers up to population figures gives 64,421,005 individuals and 27,819,672 households for 2016/17 and 64,641,350 individuals and 27,622,910 households for 2017/18.

3.3 Imputations and assumptions

The FRS data are obtained from the UK Data Archive at the University of Essex.[24] Adjustments to variables are kept to a minimum.

It should be noted that in the 2016/17 and 2017/18 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.

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[21] Then, the Office of the Deputy Prime Minister.

[22] Northern Ireland Statistics and Research Agency.

[23] For more detail about the extent of imputation and control totals variables used to generate grossing factors, see DWP, Family Resources Survey 2016/17 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692141/family-resources-survey-2016-17-background-note-and-methodology.pdf and 2017/2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/789455/family-resources-survey-2017-18-background-note-methodology.pdf

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

FRS data include a single variable covering all state pension payments. As well as the basic state retirement pension, this includes payments under the State Earnings Related Pension Scheme (SERPS) and the graduated pension scheme that preceded it (under which some current pensioners receive relatively small payments) and the State Second pension which followed it. It also includes any increases due to deferred retirement. This single variable is split into two in the EUROMOD database. One part is the basic state pension. 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 SERPS/State Second Pension.

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 benefit), 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 on stratum average is imputed to missing households only). By default, *tmu02* is used.

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[25] 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 EUROMOD this variable is used to distinguish IS from ib-JSA.

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, Invalid Carer Allowance, etc.).

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[25] 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.

Earnings and hours of work variables

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*). Moreover, last employment earnings not from the last pay period are recorded in the variable *yot02*, but these do not enter in the simulations or the definition of disposable income. Each earning variable, with the exception of *yot01*, has a corresponding hours of work variable: *yem* (*lhw00*), *yse* (*lhw01*) and *yot02* (*lhw02*). The total number of hours, *lhw*, is equal to *lhw00+lhw01*.

Local reference rent and housing benefit restrictions

Local Housing Allowance (LHA) restricts entitlement to Housing Benefit for tenants in privately rented accommodation. It has been gradually rolled out from 7th April 2008 and it is fully in place from 2013.

The amount of the benefit results from a combination of a claimant's actual rent and the LHA rate that applies in their local area (specifically, LHA entitlement = min(LHA rate, actual rent+£15) in 2008-2010; and LHA entitlement = min(LHA rate, actual rent) from 2011 onward). See section 2.5.9 for more details on calculations.

LHA rates were initially set at the median of local rents within each Broad Rental Market Areas (BRMA) and separately according to the dwelling's number of bedrooms.

The End User License version of the FRS reports only standard regions of residence for each individual. Thus, in order to include the information about LHA into the input data used by EUROMOD we need to approximate the local LHA rate faced by claimants in each region. To do this we link the FRS by region to a Local Authority District (LAD)-BRMA table[26].and compute averages of LHA rates across standard regions. A new variable *bhoen50* for each household records the 50th centile of local rent for the corresponding number of bedrooms per house. By doing this, we are also able to model the cut in LHA rates starting from April 2011 that sets LHA rates at the 30th centile of local rents for 6 dwelling categories (*bhoen1130*) for new claimants and the further cut in LHA from April 2012 that sets LHA rates at the 30th centile of local rents by 5 dwelling categories (*bhoen30*).

Increase in female pension age

From 6 April 2010, the age at which women become entitled to the State Pension (SPA) and cease having to pay National Insurance contributions is rising by six months every year (hence, one year every two years) from its pre-2010 level of 60. The state pension age will then rise from 65 to 66 for both men and women between December 2018 and April 2020. 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. But it also has implications for household incomes, as it affects receipt of several state benefits and liability to national insurance.

During the financial year 2016/17, the State Pension age (SPA) for women increased from 63 years and 1 months to 63 years 7 months. In our base data (FRS 2016/17), we observe women entitled to SPA from age 63, while in 2016 women were entitled to State Pension only from age 63 and one month[27], and in 2017 from age 63 and seven month and so on. Therefore, only some women age 63 observed receiving the State Pension in our base data in 2016, would not be entitled to it in our simulated year 2016 and only some of those aged 63 would be entitled to it

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[26] We would like to thanks Alex F. Fenton, Research Fellow at the Centre for Analysis of Social Exclusion London School of Economics who kindly made this table available to us.

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

in 2017. 63 years old women in 2016 could either be working, inactive or receiving/entitled to some kind of income replacement benefit.

We allow for some mechanical response to the increases in the female SPA for these affected women[28]. Moving toward 2017, 2018, 2019 and 2020, when we observe 63 or 64 years old women in 2017 (2018, 2019 and 2020) in receipt of basic state pension or over pension-age benefits we, first, remove entitlement to the basic state pension, pension credit, and other benefits payable only to those above the female SPA (this is done directly in EUROMOD by policy *PAA_uk*); and second, we predict entitlement to IB/ESA, which are invalidity benefits paid only to working-age adults. We do this by using data on women aged 62-64 in our base data to estimate a probit regression of receipt of IB/ESA, using the following as predictors: education, region or residence, council tax band, housing tenure, marital status, whether partner works (if present) and local authority disability status. This regression is then used to generate predicted IB/ESA entitlement probabilities for women age 63 and over (up to the new SPA) in our base data. Finally, we allow for a labour supply response to the rise in the female SPA amongst the women directly affected. We do this by using data on women aged 54-68 in our base data to estimate a regression of employment status, using the following as predictors: education, number of children in various age groups, region, housing tenure, council tax band, local authority disability status, entitlement to Disability Living Allowance (DLA), a cubic in age and an indicator variable for being under SPA. For women in couples we include an indicator of the partner's employment status. We use this to predict the probability of being in work for women 63 and over (up to the new SPA) in our base data in a world where the SPA has increased over 63 years. Aggregating these predicted probabilities tells us the predicted proportion of those directly affected by the SPA change who will be in work after that change, and we then select sufficient number of women with highest predicted probabilities of being in work when below SPA in order to match the predicted increased employment rate each year. Finally, for those women aged 63 and over (up to the new SPA) whom we have now simulated as being entitled to ESA/IB or being in work, we impute additional information (each woman simulated as being entitled to IB/ESA is allocated an IB/c-ESA amount (*bdict01yy* or *bdict02yy*), disability status (*ddi01* and *ddi02* = 12, 13, …, 18 indicating the year when somebody become entitled to IB or ESA respectively) and duration on benefit (*ddipd00*), and women simulated as being in work are allocated a monthly earning (*yemiv* or *yseiv*), hours of work (*lhwiv01* or *lhwiv02*) and a compulsory private pension contribution (*tpceeivpx*)). [29]

Although relatively complicated, this procedure still embodies the following assumptions:

- People below the original SPA and those above the new SPA are not affected by the rise in SPA: in this sense, there are no anticipation effects or dynamic effects on employment of raising the SPA.

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[28] Note that this correction for the moment only applies moving forward, hence using 2010 data on 2011-2015 systems, using 2012 data on 2013-2015 systems, using 2013 data on 2014-2016 systems and using 2014 data on 2015-2017 systems. Using 2010 data on systems before 2012 does not need any pension age adjustments because the SPA corresponds to that observed in the data; while using 2012-2014 data on system years before 2012-2014 respectively, would mean that female age 60(61) observed in work or receiving working-age benefits in the data, would have instead been eligible to pension and pension-age benefits in those years. EUROMOD does not correct for these inconsistencies between SPA and receiving working-age benefits because only few observations are affected by this issue. However, as more recent data will become available, more women will be observed in work or receiving working-age benefits in the data, while they would have been eligible to pension and pension-age benefits in previous years. We will consider this issue and how to adjust the data backward in future country reports.

[29] We do this by matching on the propensity score, where the "treatment" variable identifies people being either below SPA and the propensity score is estimated using a probit regression with the same predictors as the employment equation, other than the cubic in age.

- Other members of the household not directly affected by the SPA increase do not change their labour market behaviour (i.e., no change in hours worked or postponed retirement).

Having simulated the additional IB/ESA entitlements and gross earnings, we can run the modified base data through EUROMOD.

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 allowance (ESA) instead. By 2014 all those unable to work through disability or ill health should have been transferred from IB to ESA. This is not the case and both the FRS 2016/17 and FRS 2017/18 still record some individuals receiving IB instead of ESA. In simulating the population in 2017-18, we take into account the steady fall in the number receiving IB, and the steady rise in the number receiving ESA assuming that the transition between IB and ESA will be completed by June 2018. We replicate changes between 2016-2017 and 2017-2018 by randomly selecting some individuals receiving IB in our base data to no longer receive it, and, from those, randomly select some to receive ESA.

Of those reassessed, we assume that 30% move into the Support Group, 29% to the Work Related Activities Group (WRAG) and 41% are found to be fit for work and lose entitlement to disability benefits (figures taken from https://www.gov.uk/government/statistics/work-capability-assessment-support-group-outcomes-and-disability-benefit-history-of-esa-claimants).

The final imputed IB/c-ESA benefit values for each year are recorded in specific variables. The IB amount is saved *in bdict0111-bdict0117* for each simulated year between 2011 and 2017. The c-ESA amount is reported by *bdict0211-bdict0218* for each year between 2011 and 2018. From 2018 nobody should be receiving IB anymore. In EUROMOD this is taken into account by setting the default values of variables *bdict01* (IB) and *bdict02* (c-ESA) to the appropriate variable for the policy system in use within the parameter sheet *SetDefault_uk*.

From April 2012, contributory ESA for those in the WRAG has been limited to a maximum duration of one year. We simulate this by removing entitlement from some of those we estimate to be entitled to c-ESA.

3.3.1 Time period

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 EUROMOD database. In the EUROMOD 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 EUROMOD database variables see the UK Data Requirements Document (DRD).

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

3.3.2 Gross incomes

Gross incomes are imputed using the simple formula:

Gross income = net income + tax + employee social insurance contributions + other deductions

FRS data include variables on income tax, employee social 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 tax-payers 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.

3.3.3 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 EUROMOD to be entitled results in over-estimates of most of these instruments and an under-estimate of poverty and inequality. To adjust for this we employ a simple non take-up correction by applying the take-up proportions estimated on a caseload basis by the Department of Work and Pensions (DWP, 2010) and HM Revenue and Customs (HMRC, 2010).[30] For 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 (24% of all families with children). Of those entitled to Pension Credit, 23.5% do not take up, with the proportion much higher (51%) 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 the Table 44, some of this effect is captured.

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

Table 44 Take-up probabilities

Benefit and tax credit claimant type	Probability of take-up
Housing benefit for pensioners (>60/65) if not receiving PC(GC)	0.84
Housing benefit for people of working age in work if not receiving IS	0.58
Housing benefit for people of working age without work if not receiving IS	0.93
Council tax benefit for owners (with and without mortgage) if not receiving IS or PC	0.36
Council tax benefit for tenants if not receiving IS or PC(GC)	n/a
Council tax benefit for private tenants	0.77
Council tax benefit for social tenants	0.87
Pension credit (guarantee or guarantee + savings)	0.64
Pension credit (savings only)	0.47
Income support for people without children	0.82
Income support for people with children	0.89
Child tax credit* and working tax credit for lone parents (not London)	0.96
Child tax credit* and working tax credit for couples with children (not London)	0.72
Child tax credit* and working tax credit (all parents) in London	0.80
Child tax credit* and working tax credit (all parents) in Scotland	0.85
Child tax credit* and working tax credit (all parents) in Wales	0.86
Child tax credit* and working tax credit (all parents) in Northern Ireland	0.84
Child tax credit family element only	0.66
Working tax credit (no children)	0.31
Working tax credit (no children) – single	0.35
Working tax credit (no children) - couple	0.23

Notes: * If parents are taking up IS, CTC is assumed to be taken up.
Source: DWP 2017 and HMRC 2017
https://www.gov.uk/government/statistics/child-benefit-child-tax-credit-ctc-and-working-tax-credit-wtc-take-up-rates-2016-to-2017 and
https://www.gov.uk/government/statistics/income-related-benefits-estimates-of-take-up-financial-year-2016-to-2017

The correction is switched <u>on</u> by default in the baseline. To switch the take-up corrections off throughout any UKMOD module, a user needs to apply the relevant switch (BTA) from the run window of EUROMOD. Take-up probabilities summarised in Table 44 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. A user 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.

3.3.4   Updating

Information about the factors that are used to update (or backdate) monetary variables (parameter sheet *Uprate_uk*) from the mid-point of the data year (respectively October 2016 for FRS 2016/17 and October 2017 for FRS 2017/18) to the mid-point of the policy years applying on June 30th (i.e. October 2017 to October 2020) and the sources that have been used are reported in Annex 1. 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 2020/21 system, we uprate financial variables for households that appear in the base dataset 2017/18 FRS (such as earnings, other sources of income, some expenditures which are subsidised by the tax system, such as rental costs and spending on childcare) by using the latest forecast of earnings and prices made by the Office for Budget Responsibility.[31]

3.4   Pooled Datasets

Together with the usual EUROMOD input data, a new set of pooled EUROMOD input datasets have been produced, namely: UK_2016_b3 and UK_2017_b1. They pooled together three consecutive EUROMOD input files at the time. The increased sample size allows increasing variability in the data especially when analysing subnational reforms affecting subgroups of the population (i.e. lone parents in Scotland and Wales).

For both datasets no households have been dropped from the sample. The sample weights have been adjusted to make the sample representative of the UK population. For each observation the income period from the original FRS is stored by variable *dpd* (income data period). Variable *dpd* is used in policy *Uprate_uk* (parameter *DBYearVar*) by EUROMOD for uprating monetary values by linking to the uprating indices table.

Table 45 UKMOD pooled datasets description

	UK_2016_b3	UK_2017_b1
Original name	Family Resources Survey	Family Resources Survey
Provider	Department for Work and Pensions	Department for Work and Pensions
Year of collection	2014/15, 2015/16, 2016/17	2015/16, 2016/17, 2017/18
Period of collection	April 2014 – March 2017	April 2015 – March 2018
Income reference period	Current year incomes as indicate by *dpd* variable	Current year incomes as indicate by *dpd* variable
Sample statistics:		
Number of individuals	132,610	130,670
dpd=2014	44,787	--
dpd=2015	43,678	43,678
dpd=2016	44,145	44,145
dpd=2017	--	42,847
Number of households	58,237	57,807
Sample weights (*dwt*):		
Mean	481.9678	492.2564
SD	268.863	286.3258
Maximum	13,225	13,225
Minimum	73.67	73.67
Max/Min	179.52	179.52
Population statistics		
Number of individuals	63,913,747	64,323,142
Number of households	27,537,362	27,663,669

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[31] The analysis was finalised in September 2019, and so we use the OBR forecasts from the Spring Statement 2019.

4. VALIDATION

4.1 Aggregate Validation

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

Table 46 Components of disposable income

	EUROMOD	FRS
	ils_dispy	NINDINC+CHINCDV
Employee cash or near cash income	+	+
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' 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	+

4.1.1 Components of disposable income

The definition of disposable income in EUROMOD follows closely FRS definition with the only difference being that the FRS net individual income (NINDINC for adults and CHINCDV for children) results from the sum of (already) net income components. In particular, total individual net income in FRS is the sum of the following components: net income from employment (NINEARNS), net earn from self-employment (NINSEIN2), net investment income (NININV), income from retirement pension including pension credit (INRPINC), net

pensions income (NINPENINC), total income from disability benefits (INDISBEN[32]), total income from other benefits (INOTHBEN[33]), remaining income (NINRINC[34]) and total amount of tax credits received (INTXCRED[35]).

The disposable income in EUROMOD is constructed using (whenever possible) simulated "gross" components but explicitly including together with earnings, pensions and benefits also taxes and social insurance contribution, hence, the values of the two disposable income concepts are not identical. The differences between EUROMOD and the FRS are outlined in Table 46.

4.1.2   Validation of incomes inputted into the simulation

- *Earnings*

While many sources of original income are difficult to validate because of lack of independent and comparable sources of information, this does not apply to earnings from employment. Table 47 compares aggregate earnings in EUROMOD with estimates from the Annual Survey of Hours and Earnings (ASHE) in 2016 to 2017. ASHE is based on a 1% sample of employees on the Inland Revenue PAYE register for February and April in the relevant year, 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 47 shows that average earnings across all employees in the EUROMOD/FRS 2016/17 and 2017/18 databases is close (5% and 3% overestimated) to the corresponding average value from ASHE 2018, across all employees whose pay is not affected by absence. The male and female earnings are over-represented. Also shown are the EUROMOD averages for 2018 compared with ASHE for the corresponding years (the latest ASHE data at the time of writing was the 2018 data released: 25 October 2018). The match is similar for the non-updated or backrated FRS data, with the EUROMOD estimate over-representing ASHE slightly in 2018 by 3%.

Figure 4.1 compares the cumulative earnings distribution from ASHE and the EUROMOD input data for 2016 for all employees and for men and women (plotting decile points cumulatively). Figure 4.2 compares the cumulative earnings distribution from ASHE and the EUROMOD input data for 2017 for all employees and for men and women (plotting decile

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[32] 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.

[33] 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, Guardians 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 CTB, 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 benefit.

[34] 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.

[35] Total amount of tax credits sums Working Tax Credit and Child Tax Credit.

points cumulatively). The distributions are close; although the distribution diverges around the middle for men (earnings are somewhat lower in the ASHE data).

Table 47 Average gross monthly earnings from employment in 2016-2018, comparing ASHE and the EUROMOD (EM) input database

	2016			**2017**			**2018**		
	EM	**ASHE**	**Ratio**	**EM**	**ASHE**	**Ratio**	**EM**	**ASHE**	**Ratio**
All	2389	2275	1.05	2408	2331	1.03	2480	2405	1.03
Male	2875	2742	1.05	2872	2803	1.02	2958	2889	1.02
Female	1889	1800	1.05	1921	1849	1.04	1980	1911	1.04

Sources: Source: Annual Survey of Hours and Earnings 2018 and earlier years, Office for National Statistics. Table 1.1a, weekly gross pay including overtime for adults whose gross pay was not affected by absence, multiplied by 4.333 to produce the monthly figures. Latest version available via https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurve yofhoursandearnings/2018

Figure 4.1 Cumulative earnings distributions in 2016: EUROMOD (FRS) and ASHE
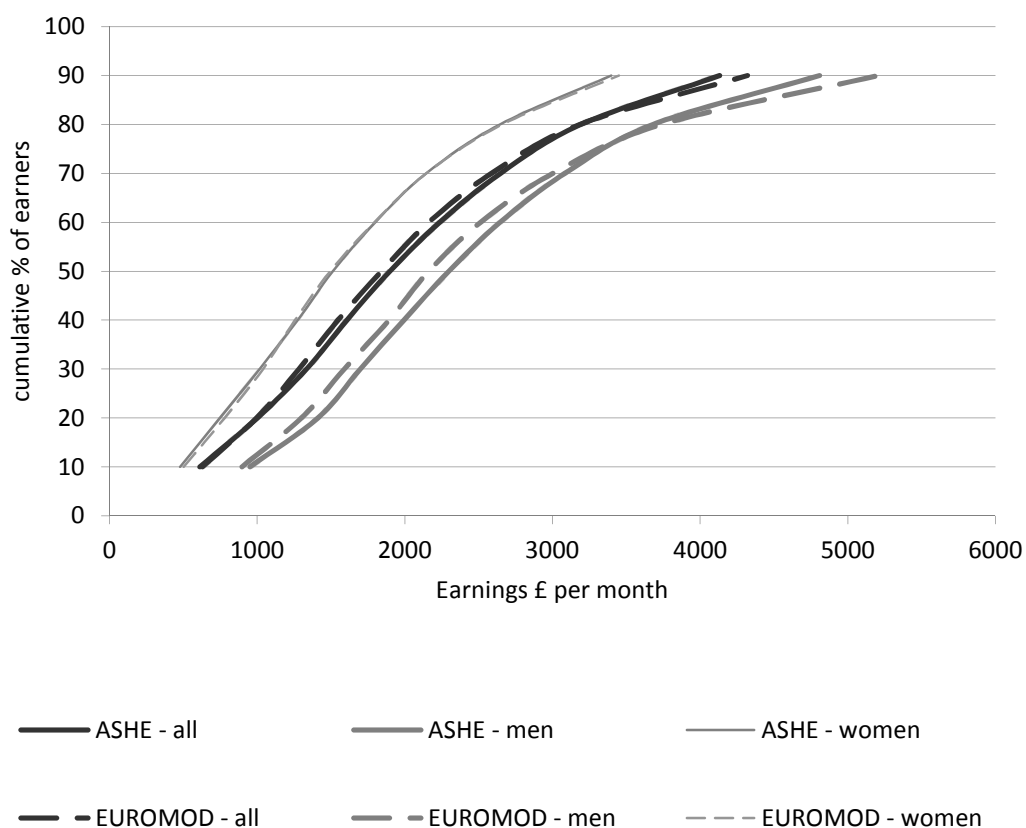
Figure 4.2 Cumulative earnings distributions in 2017: EUROMOD (FRS) and ASHE

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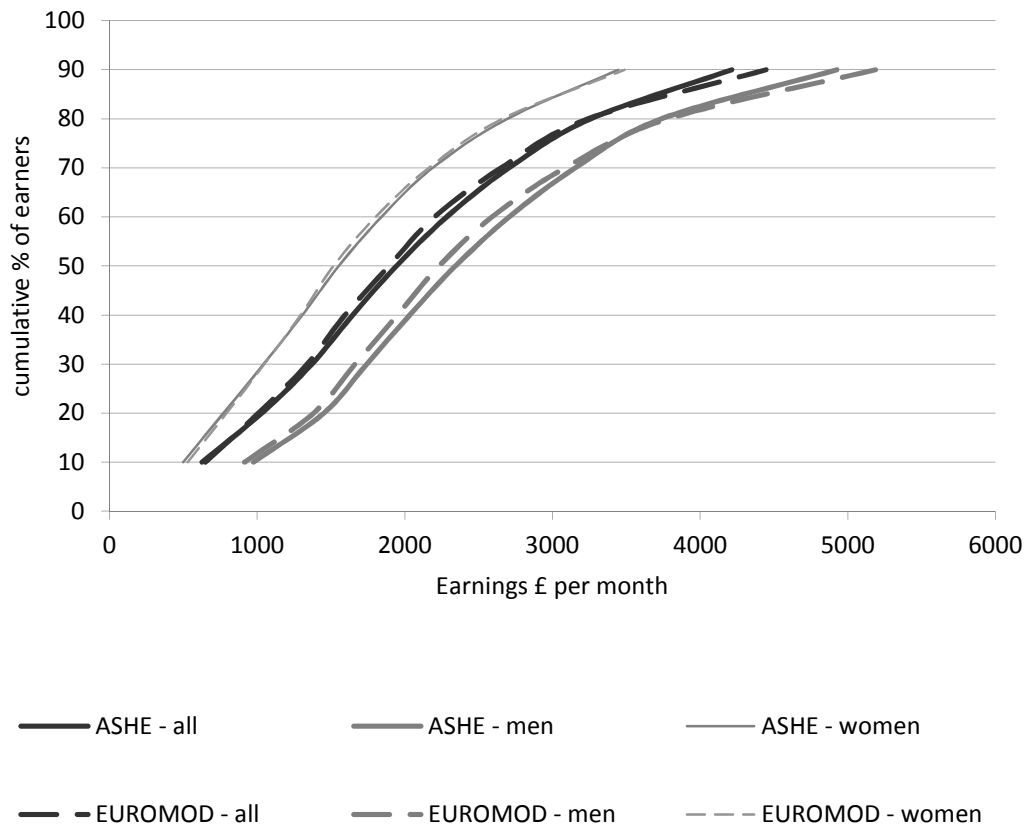
- *Benefits and taxes*

Table 4.4 and Table 4.5 compare statistics on benefits and taxes that are not simulated by EUROMOD with external sources. This provides an assessment of the quality of the database and hence the estimates are referred to as "EUROMOD/FRS estimates" although in a few cases some imputation has taken place in order to provide EUROMOD with the necessary information for simulation (see previous section). The tables also provide some useful background information for the validation of simulated components of income which may depend on, or are associated with, the non-simulated components.

Table 4.4 (annex 3) shows the ratio of the EUROMOD/FRS estimate of the number of recipients of benefits or payers of tax to that given by administrative statistics. The EUROMOD/FRS estimate is generally the same for each policy year but the external estimate naturally varies with time. Exceptions are the EUROMOD estimates for Incapacity Benefit and Employment and Support Allowance 2016-2017 and the State Pension 2016-20, since these vary over time according to our imputations related to the phasing out of Incapacity Benefit and phasing in of Employment and Support Allowance, as well as the increase in the state pension age for women from 60 to 61 years of age in 2012 and 2013, 62 in 2014 and 2015, 63 in 2016, 64 in 2017 and 65 from 2018 onwards. See Section 3.3 "Increase of female pension age" and "Transition from Incapacity Benefit to Employment and Support Allowance".

According to official sources, the combined number of Incapacity Benefit (IB) and contributory Employment and Support Allowance (c-ESA) recipients is under-reported in FRS by 38% in 2016 (reflecting over-reporting of IB by 20.67% and under-reporting of c-ESA by 90%) and

under-reported in the base data of 2017 by 41% (reflecting over-reporting of IB by 19.50% and under-reporting of c-ESA by 90%). Over time the recipients of these benefits have slightly decreased, a trend that is partly simulated by EUROMOD as well (see Section 3.3). However, number of recipients remain under-simulated in EUROMOD/FRS by 51% in 2018, 44% in 2019 and 43% in 2020. Base on initial forecasts, the transition from IB to ESA should have been finalized by 2014[36], however separating the two sources of incapacity support reveals that in reality the transition has been slower than expected and some people remain on IB up to 2017. EUROMOD/FRS over-simulates recipients of IB in 2016 and 2017 and under-simulates those in receipt of c-ESA.

Similarly while the numbers in receipt of basic state retirement pension are well estimated in EUROMOD in 2016 and 2017 (the external figures are adjusted to remove recipients living outside the UK) the actual numbers decrease slowly over the period but our simulation of the effect of the rising state pension age for women reduces the EUROMOD estimate from 2016 to 2020 more slowly (see section 3.3). It is likely that the general trends of number of retirees qualifying for the pension in their own right, plus the ageing of the population, neither of which are captured in our simulation, is the cause of this discrepancy.

In contrast, recipients of the Second State pension are underestimated by EUROMOD/FRS by 23% in 2016 decreasing to 18% in 2017, 15% in 2018 12% in 2019 and 8% in 2020. The two sources of state pension are not distinguished in the data, our imputations may contribute to this over/under-estimation (see section 3.3). One might expect both to be under-estimated to some extent, because of not capturing recipients living in residential care.

Widows/Bereavement benefit recipient numbers were slightly falling between 2016 and 2017, increasing in 2018 and falling again after that. They are under-estimated by 9% in EUROMOD in 2016 but overestimated by 76% in 2017, 53% in 2018, 59% in 2019 and 72% 2020.

For some of the benefits with small numbers of recipients (especially Maternity allowances but also War pension and Industrial Injuries Disablement allowance), it is to be expected that there would be a wide variation around the actual number from a survey.

The actual number in receipt of Carer's Allowance has grown over the period and in 2016 it is underestimated in EUROMOD/FRS by 22%, 8% in 2017 and 2018, 9% in 2019 and 13% in 2020.

Severe Disability Allowance (SDA) is significantly under-reported in the FRS and this is thought to be explained by respondent confusion between SDA and the disability premia in the Pension Credit (PC). In 2017 external sources show a sudden drop in number of recipients which cannot be capture by the static simulation of EUROMOD. Many claimants of one of these benefits receive both SDA and PC and may not report the actual situation accurately when asked in the survey. Attendance allowance (AA) is also under-reported, by 44% between 2016 to 2018 and 45% in 2019 to 2020. Disability Living Allowance (DLA) is being replaced by Personal Independence Payment (PIP) for new claimants from 2013. EUROMOD underestimates recipients of these benefits in 2016 (14%), 2017 (20%) and 2018 (4%) and overestimates them in 2019 (8%) and 2020 (28%). For PIP, EUROMOD overestimates recipients between 2016 and 2019 and underestimates them in 2020 (7%).

Finally, on the basis of a 2011 comparison (later figures are not available) the number of Council Tax payers appears to remain well-in trend with previous years in the FRS. However, past external figures correspond to the number of dwellings on which payments were potentially due and includes second homes and empty properties which are not captured by the FRS data.

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[36] EUROMOD assumes that everybody entitled to some disability support has transitioned from IB to c-ESA by 2018, thus no IB recipients are simulated from 2018 onwards.

Table 4.5 (annex 3) shows ratios of EUROMOD estimates of total expenditure on each benefit (or revenue from Council tax) and administrative totals. In this comparison the expenditures vary across policy years, driven by the uprating factors described in the previous section. Generally, the closeness of expenditure/revenue estimates to external statistics follows the same pattern as for the number of recipients/payers shown in Table 4.4 suggesting that average amounts per recipient/payer are approximately right.

In the case of contributory ESA the ratios for expenditures are always a higher than those for recipients due to the fact that imputation of benefit amount assumes that the claims are within the "main phase" (not assessment phase). The amount paid in the main phase is higher and it includes the support or WRAG component, while in the assessment phase only a lower "basic" amount without any addition is paid.

External figures for Gross Council tax revenue were not available between 2016-2020, hence comparison with actual numbers was not possible.

Under-representation of non-simulated benefits has implications for the values of the benefits that are simulated that depend in some way upon receipt of the non-simulated benefits. Where receipt of the latter automatically "passports" eligibility for a simulated benefit this will lead to under-estimation of that benefit. On the other hand if income from the non-simulated benefit is included in a means-test for a simulated benefit, under-estimation of the former will lead to over-estimation of the latter. Similar mechanisms apply in reverse to the case of over-estimation of non-simulated benefits.

4.1.3   Validation of outputted (simulated) incomes

Validation of simulated elements of income is carried out in relation to independent external sources. Table 4.6a (annex 3) shows comparisons of the number of benefit recipients and tax and contribution payers against official statistics based on administrative sources. These comparisons assume 100% take-up of means-tested benefits and tax-credits. Table 4.6b (annex 3) repeats the comparison for the means-tested instruments, applying non take-up probabilities as described in the previous section.

Table 4.7a (annex 3) shows the aggregate annual expenditure, or revenue from each instrument, compared with official sources, assuming full take-up. Table 4.7b (annex 3) makes the same comparison for means-tested benefits and tax credits, correcting for non-take-up. Finally, Table 48 (below) compares EUROMOD and external estimates of expenditure for 2016 for selected simulated benefits and tax credits with aggregates from the FRS data (using the same weights as in the EUROMOD estimates).

Table 48 Selected benefits that are simulated by EUROMOD: comparison of aggregates with external statistics and data from FRS (2016/17) assuming partial take-up in EUROMOD estimates. Expenditure/revenue (£million/year)

	FRS 2016	EUROMOD 2016	External 2016	Ratio FRS / External	Ratio EUROMOD/ External
Child Benefit	10,420	11,402	11,640	0.90	0.98
Working Tax Credit (WTC)	4,146	3,778	6,299	0.66	0.60
Child Tax Credit (CTC)	15,012	14,442	20,726	0.72	0.70
CTC and WTC	19,158	*18,201*	*27,429*	0.70	0.66
WTC only	925	*501*	*931*	0.99	0.54
Income Support+JSAinc+ESA	4,494	13,711	13,987	0.32	0.98
Universal Credit	n/a	3,191	1,585	n/a	2.01
Pension Credit (PC) total	3,709	4,566	5,666	0.65	0.81
Housing benefit (total)	18,541	18,043	23,441	0.79	0.77

Source: See Table 4.7b Annex 3.

- *Child benefit*

EUROMOD produces estimates very close to the administrative figures for the number of families in receipt of child benefit. Given the universal nature of the benefit and the fact that the FRS weights control for the number of families with children eligible for child benefit (in 2016/17), this is not surprising. However, the number of children for whom benefit is received is under-estimated by 3% and the expenditure on the benefit under-estimated by 2% in 2016. Nevertheless, as shown by Table 48 the FRS data on Child Benefit (weighted) under-estimate expenditure by more: 10%. Estimations over the period remain in line with those of 2016.

- *Winter fuel allowance*

EUROMOD over-estimates recipients by 6% and expenditure by 2% in 2016. There is no clear reason for this pattern given that the payment depends only on the age of the oldest person in the household. By 2020 the number of recipients is only overestimated by 3% while expenditures are estimated correctly.

- *Means-tested benefits and tax credits*

When complete take-up of means-tested benefits and tax credits is assumed (as in Table 4.6a for recipients and Table 4.7a for expenditure) the number of recipients in 2016 is over-estimated compared with administrative statistics. This applies particularly to Income Support (including income tested JSA and income tested ESA), Pension Credit Working and Child Tax Credit, Housing Benefit and Universal Credit from 2017 onwards. Once the take-up correction described in section 3.3.3 is applied, as shown in Table 4.6b, the ratios of the number of recipients generally improve and move closer to one. The numbers on Income Support (including other working-age income tested benefits) are high relative to external statistics (by 19%) similarly, recipients of Child Tax Credit are also overestimated in 2016 (by 20%); but Pension Credit, Working Tax Credit, Housing Benefit and Universal Credit recipients are under-estimated in 2016 respectively by 15%, 32%, 11% and 6%.

For Income Support (including other legacy working age income tested benefits), Pension Credit, Housing Benefit and Universal Credit the expenditure is over-estimated by EUROMOD before any take-up correction for 2016-2018, then are underestimated for 2019-2020 (Table 4.7a) while it is low for Working Tax Credit (by 11%) and Child Tax Credit (by 14%). The take up correction (Table 4.7b) reduces expenditure such that the total spending on Income Support, income-based JSA and income-based ESA is under the administrative total by 2%, Housing Benefit by 23%, Pension Credit by 19%, Child Tax Credit by 30% and Working Tax Credit by 23% (Table 4.7b). Spending on Universal Credit remains over-estimated even after correction for take-up is applied. Correcting for take-up in the way that we do does not allow for the fact that within client group, it is likely that those with small entitlements are the most likely to not claim. Our caseload-based correction thus probably over-corrects on an expenditure basis for some means-tested benefits on the legacy system. However, with the exception of the Working Tax Credit, Table 48 shows how the weighted aggregates from FRS are generally similar to those from EUROMOD or compare less favourably with external statistics.

We now consider each benefit/credit separately and discuss reasons for the apparent discrepancies.

- *Tax Credits*

Probably the main cause of the apparent under-estimation of both Child Tax Credit and Working Tax Credit is related to the administrative statistics that we use which are for finalised awards of Tax Credits. Adjustments are made after the end of the tax year to take account of changes in income during the year. It is likely that those with changes that lead to increased entitlement would re-claim during the year. Thus those with end of year adjustments are likely to see reductions in their awards. Our simulations, on the other hand, are based on current incomes and circumstances. If circumstances stay the same all year our simulation should match the final award. However, as shown by Table 48 FRS reported income from Child Tax Credit is also low relative to the administrative total. This may be due to respondents not knowing how much of their total tax credit payment is from WTC or from CTC. It is also possible that the FRS data under-represent the CTC client group.

Working Tax Credit expenditure is also underestimated (by a little under half the administrative figure) for the same reasons, that is due to the "overhang" of entitlement, especially when there is a large year-to-year disregard. Entitlement is even more likely to vary over the year as this depends on being in low paid work which is likely to be unstable in various ways. Working Tax Credit recipients are also dramatically under-estimated by EUROMOD (by 32%) relative to Child Tax Credit recipients and the "overhang" is again the explanation. Families are unlikely to shift on and off Child Tax Credit but are likely to meet the eligibility criteria for Working Tax Credit for short periods but still receive payments when they would not qualify if re-assessed. Finally, note that some of the mismatching might be due to the widening introduction of Universal Credit, replacing the 'legacy benefits' from 2013. EUROMOD randomly allocates benefits recipients to either the legacy system or the universal credit system. It is possible that this method contributes to the mismatch described above. Future versions will look at improving it.

- *Income Support*

Even after the take-up correction the number of recipients of Income Support (IS) is over-estimated by 58% (Table 4.6b). (The external figures include those on income-tested JSA which are simulated along with Income Support in EUROMOD.) The numbers on income-related ESA are under-estimated in 2016 (by 11%). The period of transition for those potentially qualifying for IS or ib-ESA was supposed to last until 2014, however in reality there are still

people receiving IB in 2017 and it is difficult to capture the individual components correctly in EUROMOD simulations in particular because the entitlement to ib-ESA is based on a "limited capability for work" which is not explicitly measured in the FRS. The combined (IS+ib-JSA+ib-ESA) total expenditure from EUROMOD is fairly high relative to the external total (by 19% in 2016 rising to 21% in 2017, and to 22% in 2018 but underestimated by 37% in 2019 and 2020).

- *Pension Credit*

After accounting for non take-up, Pension Credit recipients as a whole are under-reported by 15% as well as by 19% for the total pension credit expenditure in 2016, while by 2019 these discrepancies reduce respectively to 3%, but increase for expenditure to 22%. However, the external administrative total includes payments to recipients living in institutions who are not captured by FRS/EUROMOD. The shortfall might be explained by EUROMOD not controlling for size of entitlement in the take-up adjustment (although it is worth noting that our adjustment does move the aggregate number of recipients in the right direction).

However, within PC there are too few recipients of Saving Credit alone or recipients of both Savings Credit (SC) and Guarantee Credit (GC) compared to those receiving GC alone. The latter may rise when the incomes which give rise to SC entitlement are under-reported. This maybe the case considering the under-estimation of SC recipients.

Since 2016 Pension Credit expenditure has fallen by about 15% according to the external statistics. This is due in part to cohort effects: the newly retired have higher non means-tested pensions than the older retired. It is also partly to do with the basic state pension rising as fast, or faster, than Pension Credit in this period, and because of the increase in the female state pension age. EUROMOD captures the second and third of these effects, at least in principle, but not the first. This means that estimated expenditures falls but not to the same extent as external statistics. As a result, there is a bigger shortfall in EUROMOD by 2019 compares to external statistics than at the beginning of the period (9% and 12% respectively).

- *Housing Benefit*

After the take-up correction Housing Benefit recipients are under-estimated by EUROMOD by 11% in 2016. This is similar to the under-estimation in the FRS data (under-reported by 12%). Expenditure is under-estimated by 23% in 2016 increasing to 24% in 2017 and to 30%, 53% and 54% in 2018, 2019 and 2020 respectively. The updating of rents to 2018 may not capture differential growth in rent satisfactorily and the modelling of LHA rent restrictions which were strengthened just before the beginning of this period, can only be approximated. However, since Housing Benefit is calculated at the end of the EUROMOD "spine" and entitlement depends on income including other simulated components, the main explanation for any under-estimation of expenditure probably lies in the over-simulation of some benefits/tax credits, perhaps for certain groups of people that cannot be identified in the sort of aggregate validation exercise reported here. Moreover, also the gradual introduction of Universal Credit, which has been speeding up from 2018 onwards, should contribute to the reduction of spending on Housing Benefit. On the other hand, EUROMOD transferred people from the legacy benefit system to the Universal Credit system on a random selection base. In reality, the gradual introduction of Universal Credit has been done by groups of claimants based on the specific means-tested benefits they are claiming. Our results suggest that such random allocation may not be capturing properly the transition process to UC. Future version of the model should look into ways of improving this part of the simulation process.

- *Universal Credit*

Since 2013 working-age means-tested benefits are being replaced by Universal Credit. While the initial plan was to transfer people from the so called Legacy Benefit system to Universal Credit by the end of 2018, the process has slowed down and the full introduction of Universal Credit has been moved forward to 2023/24. EUROMOD take such transition into account so that only some people each year are transferred to Universal Credit system. After controlling for take-up correction the number of recipients is underestimated by 6% in 2016, slightly overestimated in 2017 (2%) and overestimated by 23% in 2018 (Table 4.6b). Partly because of overestimation of recipients also expenditures are overestimated, even after the take-up correction (by 101% in 2016, 58% in 2017 and 45% in 2018). No external statistics are available for the latest years (2019 and 2020) to help with comparison.

- *Sure Start Maternity Grant and Best Start Grant*

EUROMOD significantly over-estimates recipients and expenditure on both the Sure Start Maternity Grant and the Scottish Best Start Grant (introduced from 2019). Eligibility to these benefits is conditioned on taking-up other means-tested benefits. This is taken into account by EUROMOD. On the other hand, the application process required for accessing these benefits may increase the non take-up issue for these benefits. This is not taken into account by EUROMOD yet. Another reason for the pattern observed is that external statistics are given by month and may not be reflecting exactly the average annual aggregate produced by EUROMOD.

- *Council Tax Benefit*

In 2013 responsibility for Council Tax Benefit was devolved to Local Authorities and renamed to local Council Tax Reduction (CTR). This scheme is different in England, Wales and Scotland and national statistics are no longer available. In EUROMOD, number of recipients and aggregated expenditures remain in line with previous years. As before, it is possible that they are over-estimated even after the take-up correction. The reasons for this are difficult to establish exactly, except that entitlement to CTR depends not only on receipt of IS or PC (in which case it is virtually automatic) but also on whether tax credits or any non means-tested benefits are received. As with Housing Benefit, to the extent that some non-simulated benefits are under-reported and tax credits are under-simulated, we might expect some over-estimation of CTR.

- *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 and the first external statistics on the numbers of households affected can be found https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/542734/benefit-cap-statistics-to-may-2016.pdf . The number of benefit units affected by housing benefit cap are well simulated in 2016, while those affected by the cap through universal credit are significantly overestimated by EUROMOD in 2016. This result is most likely driven by the fact that EUROMOD over-simulates the number of families receiving UC and as a consequence more benefit units result affected by the cap. Another reason for this may be due to the fact that not all benefits are subject to the cap and entitlement to certain benefits provides exemption. Under-simulation of such benefits and under-reported non-simulated benefit may explain over-estimation of the benefit cap (i.e. less families exempted from it) both when it applies to HB and UC.

- *Income tax*

Compared with tax statistics, the number of income tax payers estimated by EUROMOD is under-simulated in 2016 by 5 percentage points (Table 4.6a). Revenue from income tax is under-estimated by 3% (Table 4.7a).

The most likely explanation is that there is some under-reporting of high incomes and under-representation in the FRS of high income earners. Annex 2 of the 2009-13 UK Country Report describes a case study for 2010, comparing EUROMOD estimates with administrative statistics from tax records in more detail. Indeed, this is confirmed by comparing number of taxpayers and revenue by tax rate bands with official statistics. Table 4.6a shows that EUROMOD under-simulates the number of taxpayers paying tax at the basic rate – i.e. with this as their marginal rate – (with a 4% under-simulation), while the precision of the simulation varies with income (2% under-simulation of higher rate taxpayers and 10% for those paying tax at the additional rate). Table 4.7b highlights a shortfall of tax collected at the additional rate of 37% in 2016, while tax revenue collected at the higher rate (overestimated by 5%) and standard rate tax revenue (overestimated by 2%) is very well estimated (very small discrepancy in 2016).

Over the period 2016-20 income tax revenue grew by 8.7% according to external statistics but only by 1.2% according to EUROMOD. The slow revenue growth estimated by EUROMOD corresponds to a drop in number of taxpayers between 2016 and 2020 due to the increase in personal income tax allowance brought forward to 2019 and the increase of the higher rate limit to £50,000 from April 2019 (as well as the introduction of a different tax schedule for people living in Scotland from 2016 onwards).

It should be noted that the assumption that the incomes recorded in the FRS for the previous week or month are in fact received for the whole tax year is likely to have an effect on the EUROMOD estimates. If EUROMOD could account for part-year incomes there would be more taxpayers in any whole year, resulting in an over-estimate. But to the extent that a part-year income is subject to a lower average tax rate than the equivalent whole year income (because of the progressivity of the tax schedule), accounting for part-year incomes would reduce the estimated tax revenue on aggregate.

- *Social insurance contributions*

Detailed comparable external figures on employees and self-employed contributors are only available up to 2008. The only external figures on number of National Insurance contributors are available on the total. As in previous years there is a shortfall of 21%. The explanation for the underestimation of numbers of both employed and self-employed contributors by EUROMOD is that the administrative figures refer to any payment of a contribution within the year while employee contributions are paid depending on weekly earnings. At any one point in time the number of contributors is less than that shown by the administrative statistics. Consistent with this explanation, total revenue from employee and self-employed contributions are relatively well captured (only overestimated by 2% in 2016) – see Table 4.7a. Information on the number of employees for whom employers make contributions is not available. However, comparisons to the total revenue from any social insurance contribution suggest that EUROMOD is capturing well the aggregate amount over the period.

Aggregated revenue from contributions made by the self-employed are not available from 2013. EUROMOD estimates remain in line with previous years when revenue from contributions made by the self-employed were larger (by 55% in 2012, not shown) than those given in external statistics and estimates of number of contributors smaller (by 17% in 2008, not shown). The explanations for this are a combination of those provided above for income tax and for employee contributions. Self-employed contributions are of two types. Class 2 are weekly flat-rate payments and external estimates count those making any contribution within the year. Class

4 contributions depend on annual self-employment income in a previous year. The explanations for income tax are relevant for Class 4 and the explanations for employee contributions are relevant for Class 2.

4.2 Income distribution

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

4.2.1 Income inequality

Table 4.8a and Table 4.8b compare estimates of income inequality and descriptions of the income distribution from EUROMOD with those published in the official UK HBAI statistics for 2016/17. The two tables show two sets of EUROMOD estimates: assuming 100% take-up of means-tested benefits and tax credits, and using the incomplete take-up assumption. Also shown are statistics calculated by us from the FRS, using the EUROMOD sample and income concept.

The correction for non take-up improves the comparison. The Gini coefficient is increased by two points (from 0.29 to 0.31) although there is still quite a large discrepancy between the HBAI estimate (0.34) and the EUROMOD estimate (0.31). The main contributory factor is the way in which the HBAI statistics are corrected for lack of enough households with sufficiently high income in the FRS data. (The FRS estimate is the same as that from EUROMOD). The HBAI correction uses information from tax statistics to inflate the incomes of some of the higher income households in the data (DWP, 2016). This has no effect on the median or poverty estimates but does affect the HBAI estimates shown in Table 4.8b for the Gini and the income share of the top decile group. It also, by implication, reduces the share of all other decile groups. Once this is taken into account, the EUROMOD and HBAI estimates are generally quite close.

4.2.2 Poverty rates

Table 4.9a and Table 4.9b show a comparison with published UK official statistics (Households Below Average Income or HBAI) based on the same data as EUROMOD (FRS) Table 4.10a and Table 4.10b show a comparison with EUROSTAT published statistics based on SILC 2017.

Table 4.9a and Table 4.9b show the comparison of 2016/17 HBAI (Before Housing Costs) poverty statistics with EUROMOD's 2016 policy year. Because of differences due to using simulated rather than recorded income components and any differences in the precise sample or income concept[37] there is no reason to expect the HBAI and EUROMOD results to be identical. Also shown for 2016 are our own calculations using FRS micro-data and the same sample and income concept as is employed in the EUROMOD statistics. The differences between the HBAI estimates (which are rounded to the nearest whole percentage) and our own calculations (here rounded to one decimal point) indicate the effects of the different income concepts and sample selections. The EUROMOD income concept and use of the full FRS sample results in a slightly lower poverty threshold (median) and the difference mainly impacts on poverty measured at the

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[37] HBAI excludes cases with spouses living away from home. EUROMOD includes them. HBAI includes, for students, top-up loans and deducts loan repayments. EUROMOD ignores the loan repayments. HBAI adds the cash value of certain forms of income in kind (free school meals, Healthy Start vouchers and free school milk for children and free TV licences for those aged 75 and over); EUROMOD ignores these.

50% threshold especially for children. The differences between the "FRS" measures and those from EUROMOD are due to the use of simulated values for taxes and benefits, including the imprecise take-up adjustments.

Before any take-up correction, EUROMOD estimates of poverty rates are too low relative to the HBAI estimates. Using the 60% of median poverty threshold the rate from EUROMOD is 11.6% compared with 16.8% in HBAI. Once the take-up correction is applied the EUROMOD estimate rises to 14.9%. The (rounded) poverty rate is less than 1 percentage points too low relative to HBAI at the 50% and 70% thresholds.

At the 60% threshold the child poverty rate (after the take up adjustments) is 17.7% compared to 19% from HBAI. The discrepancy is 2.5 percentage points at the 50% threshold and less than 1.5 percentage points at the 70% threshold.

The comparisons for older people show that EUROMOD slightly underestimates at each threshold. At the 60% threshold the poverty rate for older people is 16.6% compared with 17% from HBAI.

Table 4.9a and Table 4.9b also compare HBAI poverty statistics using 2016/17 data with estimates from the EUROMOD baseline for the corresponding policy year. While there is no reason to expect the statistics from the two sources to move in the same way (since one fully captures economic and demographic changes as well as policy changes and the other does not), it is still interesting to compare the estimates. The HBAI estimates at the 60% threshold slightly increase from 2016 to 2017 as they do in EUROMOD but at a smaller rate.

One plausible explanation for the underestimation of poverty rates, relative to those shown by HBAI is the fact that FRS data under-report receipt of means-tested benefits, particularly Pension Credit but also some working-age income tested benefits and Housing benefits (Table 4.6b). To the extent that EUROMOD estimates provide a closer match to external statistics on recipients of these benefits, we might expect EUROMOD estimates of poverty to be lower than those from HBAI.

Under-reporting of means-tested benefits in FRS is a plausible component of the explanation of the discrepancy between HBAI and EUROMOD. However, we cannot be certain about this as it depends on the underlying reason for the FRS shortfall in recipients of these benefits. It could be due to non-reporting by recipients, misreporting by recipients (the income appears, but as part of another income component) or differential non-response by recipients. We would need to draw different conclusions, depending on which of these applies. If the main explanation is confusion about income sources by recipients, then the explanation above is not relevant. However, this seems unlikely, as few benefits are over-represented in terms of expenditure in FRS (see Table 48), although it is possible that this applies to some extent to the basic state retirement pension, leading to underestimation in recorded Pension Credit. But if this were the case, we would also expect to under-simulate Pension Credit to the same extent and this does not happen.

Comparing the poverty rates resulting from EUROMOD with the Eurostat figures (Table 4.10a and Table 4.10b in Annex 3) we find that in 2016, EUROMOD under-estimates poverty (by 11% in 2016) at 40% threshold when accounting for benefits take-up corrections. It underestimates poverty by 12% using the 50% of median threshold, by 8% and 4% using the 60% and 70% of median thresholds respectively. Differentiated by age group we see that the underestimation using the 60% threshold is largest in the 16-24 age group (by 17%). EUROMOD also underestimates poverty among children 0-15 by 9% and among 50-64 years old by 14%. By contrast, EUROMOD slightly overestimates poverty among the over 65 years old by 9%.

4.3 Summary of "health warnings"

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

Although the sample size of the FRS survey data is large by international standards, care should still be taken in interpreting results for small sub-groups of the population.

High income people, self-employment earnings and investment income are generally underrepresented, possibly due to higher survey non-response by the types of people concerned, and under reporting of such sources of income, particularly by high income respondents.

Receipt of benefits or tax credits based on past circumstances is not modelled. It is effectively assumed that entitlement is based on current circumstances. This has particular bearing on simulations of Child Tax Credit and especially Working Tax Credit, which are in practice based on income in the previous year. Final awards are only adjusted if current year income exceeds a threshold.

Our 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 poverty and inequality estimates relative to those produced officially using the same underlying data. But some benefits remain over-simulated (Income Support and Universal Credit) and others under-simulated (Working Tax Credit and Child Tax Credit). For some applications of EUROMOD users are advised to explore the full-take up option as well.

When comparing results for the UK with those 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 2016/17 and 2017/18. However, from 2012 to 2016, 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).

When using results from the 2018 to 2020 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 2017/18 (except those captured by updating by income source). In particular 2018 to 2020 baseline results do not capture the effects of recession and slow recovery on increased unemployment and inactivity or expected Brexit effects or reductions in hours worked; nor of increases in employment following increases in the size of the labour force.

The validation exercises conducted so far point to some puzzles that require further work to fully understand. Users are advised to read the validation section of this report and be aware of the issues raised in interpreting the results of their simulations.

As Universal Credit gets rolled out to everyone by 2023, simulations of the 'legacy benefits' and the UC are overestimated at times and underestimated for others. 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.

Users should also note that Universal Credit Sanctions and Conditionallities are not implemented in EUROMOD – these could further impact the total income received by families and the poverty rates estimated in this report.

5. REFERENCES

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

De Agostini P. 2018b, "EUROMOD Country Report: United Kingdom 2014-2017" https://www.euromod.ac.uk/sites/default/files/country-reports/year8/Y8_CR_UK_Final.pdf

De Agostini P. 2017, "EUROMOD Country Report: United Kingdom 2013-2016" https://www.euromod.ac.uk/sites/default/files/country-reports/year7/Y7_CR_UK_Final.pdf

De Agostini P. and H. 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

De Agostini P. and H. Sutherland, 2014, "EUROMOD Country Report: United Kingdom 2009-2013" https://www.euromod.ac.uk/sites/default/files/country-reports/Year5/CR_UK2009-13_Y5_09-07-2014final.pdf

Department for Work and Pensions (2018), Income-related benefits: estimates of take-up 2016/17, DWP: London https://www.gov.uk/government/statistics/income-related-benefits-estimates-of-take-up-financial-year-201617

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HMRC (2016), *Child Tax Credit and Working Tax Credit Take-up Rates 2015-16.* HMRC: London.

HMRC (2017), *Child Tax Credit and Working Tax Credit Take-up Rates 2016-17.* HMRC: London.

6. SOURCES FOR TAX-BENEFIT DESCRIPTIONS/RULES

6.1 General sources for tax-benefit descriptions/rules

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

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

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

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

6.2 Useful websites

www.hmrc.gov.uk

https://www.gov.uk/

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

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

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

http://www.ifs.org.uk/fiscalFacts/taxTables

7. ANNEXES

Annex 1 Updating factors

Annex 2 Policy Effects in 2018-19 and 2019-20

Annex 3 Validation Statistics

Annex 4 EUROMOD/UKMOD key income concepts

7.1 Annex 1: Uprating factors

Table 49 Monetary variables and uprating factors

Variable	Variable Label	Update factor	Update factor description
yem	employment income	$f_yem	Earnings index
yemiv	PAA: imputed employment income	$f_yem	Earnings index
yiy	investment income	$f_yiynt	Investment income
yse	self-employment income	$f_yem	Earnings index
yseiv	PAA: imputed self-employment income	$f_yem	Earnings index
bdioa	Attendance allowance	$f_bdioa	Attendance allowance
bdisc	Disability living allowance (self care)	$f_bdioa	Attendance allowance
bdimb	Disability living allowance (mobility)	$f_bdimb	Disability living allowance (mobility)
bdict	Incapacity benefit+ESA	$f_bdict	Incapacity benefit+ESA
bdict01	Incapacity benefit	$f_bdict	Incapacity benefit+ESA
bdict02	ESA	$f_bdict	Incapacity benefit+ESA
bdiwi	Industrial injuries pension	$f_bdiwi	Industrial injuries pension
bcrdi	Invalid care allowance	$f_bcrdi	Invalid care allowance + Carers Allowance
boact00	NI retirement pension	$f_boact00	NI retirement pension
bdisv	Severe disability allowance	$f_bdisv	Severe disablement allowance
bhlwk	Statutory sick pay	$f_bhlwk	Statutory sick pay
bunct	Unemployment benefit	$f_bunct	Unemployment benefit (JSAc)
boawr	War pension	$f_boawr	War pension
bsuwd	Widow`s pension	$f_bsuwd	Widow`s pension
bmana	Maternity Allowance	$f_bmana	Maternity Allowance
bmaer	Statutory maternity pay	$f_bmana	Maternity Allowance
xhcmomi	Mortgage interest payment	$f_xhcmomi	Mortgage interest payment
xhcrt	Rent	$f_xhcrt	Rent
bhoen30	Local reference rent 30th percentile	$f_xhcrt	Rent
bhoen50	Local reference rent 50th percentile	$f_xhcrt	Rent
bhoen1130	Local reference rent 30th percentile	$f_xhcrt	Rent
yot01	Earnings from odd jobs	$f_yem	Earnings index
yot02	Last earnings for those no longer working	$f_yem	Earnings index
yprnt	Income from rent received (not taxable)	$f_xhcrt	Rent
yprtx	Income from rent received (taxable)	$f_xhcrt	Rent
ypr	Total income from rent received	$f_xhcrt	Rent
xcc	Childcare costs expenditure	$f_yem	Earnings index
xhcot	Other housing costs	$f_xhcrt	Rent
xhcsc	Housing costs - service charges	$f_xhcrt	Rent
xmp	Maintenance paid	$f_yem	Earnings index
yptmp	Income from maintenance	$f_yem	Earnings index

Variable	Variable Label	Update factor	Update factor description
	received		
yptot	Other private transfers	$f_yem	Earnings index
xpp	Private and personal pension contributions	$f_yem	Earnings index
yls	Lump sum income	$f_hicp	default uprating factor (Eurostat CPI) (forecast Mar 2019 onwards)
ypp	Personal pension income	$f_hicp	default uprating factor (Eurostat CPI) (forecast Mar 2019 onwards)
tmu	Council tax	$f_tmu1	Council Tax: England
tmu	Council tax	$f_tmu7	Council Tax: London
tmu	Council tax	$f_tmu10	Council Tax: Wales
tmu	Council tax	$f_tmu11	Council Tax: Scotland
yempv_a	NRR/LMA: previous employment income	$f_yem	Earnings index
yem_a	NRR/LMA: employment income	$f_yem	Earnings index
yiynt	Tax free investment income	$f_yiynt	Investment income
yiytx	Taxable investment income	$f_yiynt	Investment income
afc	Financial capital	$f_afc	Financial capital
xhcmomc	Mortgage Payment (interest+capital)	$f_afc	Financial capital
bedsl	Student loan	$f_hicp	default uprating factor (Eurostat CPI) (forecast Mar 2019 onwards)
bedes	Student payment	$f_hicp	default uprating factor (Eurostat CPI) (forecast Mar 2019 onwards)
buntr	Training allowance	$f_hicp	default uprating factor (Eurostat CPI) (forecast Mar 2019 onwards)
boactcm	Occupational pension	$f_hicp	default uprating factor (Eurostat CPI) (forecast Mar 2019 onwards)
bot	Other benefits	$f_hicp	default uprating factor (Eurostat CPI) (forecast Mar 2019 onwards)

Table 50 Uprating factors and their sources

Update factor	Update factor description	Factor Source
$f_hicp	default uprating factor (Eurostat CPI) (forecast Nov 2015 onwards)	Eurostat CPI; financial year (April-March) average; extrapolated from Jan 2019 using UK OBR CPI forecast Table 3.5[1]
$f_yem	Earnings index	ONS financial year (March-April) annual average K54U; extrapolated from Jan 2019 using UK OBR earnings forecast Table 3.5[1]
$f_bdioa	Attendance allowance	
$f_bdimb	Disability living allowance (mobility)	
$f_bdict	Incapacity benefit+ESA	
$f_bdiwi	Industrial injuries pension	
$f_bcrdi	Invalid care allowance + Carers Allowance	
$f_boact00	NI retirement pension	Change in main rate of benefit; DWP/HMT/HMRC announcements plus statutory indexation for projections
$f_bdisv	Severe disablement allowance	
$f_bhlwk	Statutory sick pay	
$f_bunct	Unemployment benefit (JSAc)	
$f_boawr	War pension	
$f_bsuwd	Widow`s pension	
$f_bmana	Maternity Allowance	
$f_xhcmomi	Mortgage interest payment	Bank of England IUMTLMV[4]; extrapolated assuming moves with trend (2 years) [2]
$f_xhcrt	Rent	ONS[3]; extrapolated to 2019 using same method as for earnings
$f_tmuXX	Council Tax	https://www.gov.uk/government/organisations/department-for-communities-and-local-government/series/council-tax-statistics
$f_yiynt	Investment income	Newly-constructed index (2011/12=100) based on changes to rates of return using Bank of England data (see tab Bank of England interest rates). Forecast assumes no change on the previous year.

[1] https://obr.uk/efo/economic-fiscal-outlook-march-2019/
[2] http://www.bankofengland.co.uk/boeapps/iadb/index.asp?first=yes&SectionRequired=I&HideNums=-1&ExtraInfo=true&Travel=NIxIRxSUx
[3] https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/d7ce

7.2 Annex 2: Policy Effects

7.2.1 Policy Effects 2018-2019

Error! Reference source not found. and Fi show the effect of 2019 policies on mean equivalised household disposable income by income component and income decile group. The effect is estimated as a difference between simulated household net income under the 2019 tax-benefit policies (deflating monetary parameters by Eurostat's Harmonized Index of Consumer Prices, HICP) and net incomes simulated under 2018 policies, as a percentage of mean equivalised household disposable income in 2018.

The total effect of (deflated) 2019 policies on mean household income is 0.12 per cent. This is mainly the result of lower (in real terms) benefits (-0.13 per cent means-tested benefit and -0.03 per cent non means-tested benefits) and slightly higher social insurance contributions (0.09 and 0.01 respectively for employees and self-employed) only partly compensated by lower direct taxes (0.35 per cent) and slightly higher public pensions (0.03 per cent).

The distributional pattern of policy effects between 2018 and 2019 shows a clear regressive effect with the bottom two deciles losing around 0.80 per cent of income and the top four deciles gaining 0.30 per cent of income on average. The bottom part of the income distribution loses from frozen (in nominal value) means-tested and non means-tested benefits and higher Council Tax (in real terms).

Apart from the negative effect for the first decile group, direct taxes are shown by **Error! Reference source not found.**1 to have a positive impact on household disposable income between 2018 and 2019. This is mainly driven by reforms to Personal Income Tax Allowance that increasing faster than inflation, had an average positive effect on disposable household income for household from the third decile group onward.

Finally, state pension rising slightly more than inflation thanks to the triple-lock indexation, means that there are small but positive real changes to Public Pension across the income distribution for pensioners.

Table 1 Policy Effects 2018-19, using CPI indexation, %

Decile	Original income	Public pensions	Means-tested benefits	Non means-tested benefits	Employee SIC	Self-employed SIC	Direct taxes	Disposable income
1	0.00	0.09	-0.60	-0.10	0.01	0.01	-0.18	-0.78
2	0.00	0.07	-0.82	-0.09	0.01	0.00	0.00	-0.84
3	0.00	0.06	-0.23	-0.05	0.01	0.00	0.08	-0.13
4	0.00	0.06	-0.30	-0.04	0.00	0.00	0.15	-0.13
5	0.00	0.05	-0.10	-0.03	-0.01	0.00	0.22	0.14
6	0.00	0.03	-0.13	-0.02	-0.03	0.00	0.30	0.15
7	0.00	0.03	-0.01	-0.02	-0.05	0.00	0.35	0.30
8	0.00	0.02	-0.02	-0.02	-0.09	-0.01	0.40	0.28
9	0.00	0.01	-0.03	-0.01	-0.15	-0.01	0.49	0.31
10	0.00	0.01	-0.01	0.00	-0.22	-0.02	0.55	0.30
Total	0.00	0.03	-0.13	-0.03	-0.09	-0.01	0.35	0.12

Notes: shown as a percentage change in mean equivalised household disposable income by income component and income decile group. Income decile groups are based on equivalised household disposable income in 2018, using the modified OECD equivalence scale. Each policy system has been applied to the same input data, deflating monetary parameters of 2019 policies by *projected* Eurostat's Harmonized Index of Consumer Prices (HICP).

Figure 1 Policy Effects 2018-19, using CPI indexation (CPI=1.021), %
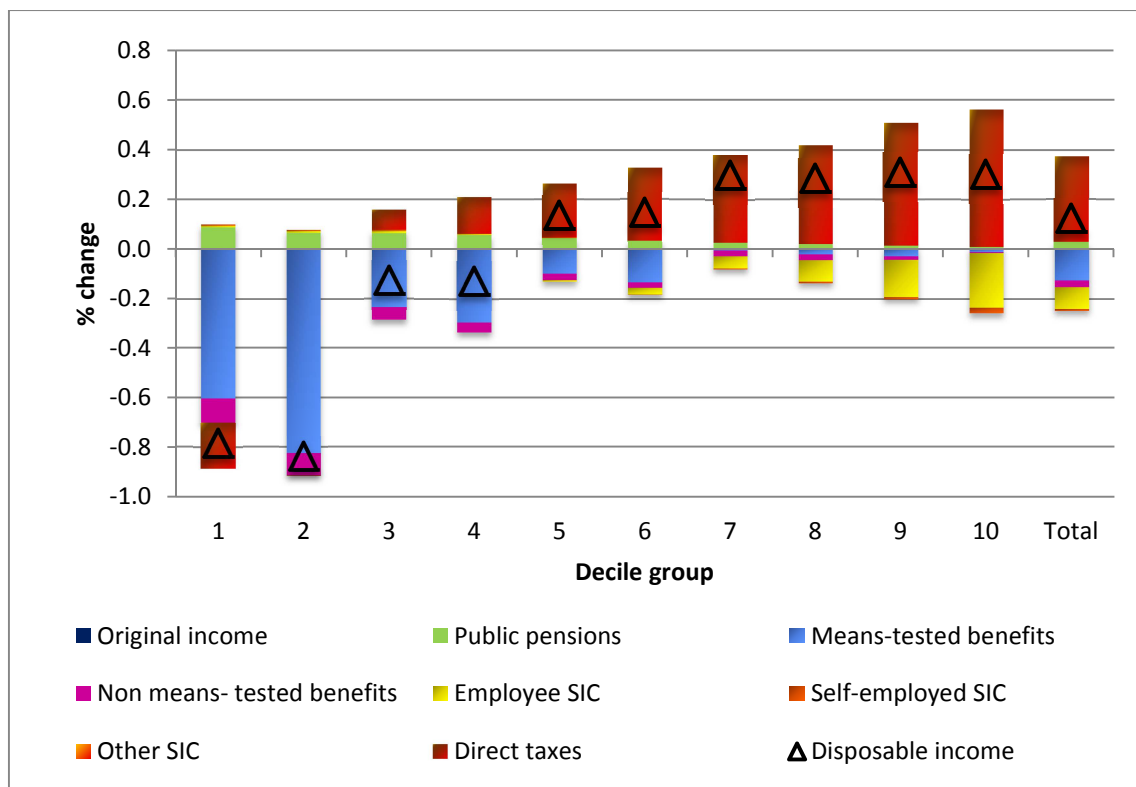
7.2.2   Policy Effects 2019-2020

Table 2 and Figure 2 show the effect of 2020 announced policy reforms on mean equivalised household disposable income by income component and income decile group. The effect is estimated as a difference between simulated household net income under the 2020 tax-benefit policies (deflating monetary parameters by Eurostat's Harmonized Index of Consumer Prices, HICP) and net incomes simulated under 2019 policies, as a percentage of mean equivalised household disposable income in 2019.

The total effect of the (deflated) announced policy reforms to be introduced in 2020 is on average negative on mean household income (-0.17 per cent). This will be mainly the result of higher (in real terms) direct taxes (-0.25 per cent) and slightly lower means-tested benefits (-0.03 per cent) only partly compensated by lower employee social insurance contributions (0.05 per cent) and higher public pensions (0.06 per cent).

The expected distributional pattern of policy effects between 2019 and 2020 is shown in Figure 2. Given the announced policies (up to the latest Spring Financial Statement on 13th of March 2019) the forecasts show progressive effects of policy changes with the bottom decile gaining around 0.20 per cent of income and the top decile losing 0.27 per cent of income on average.

Direct taxes are expected to have a negative effect on average household disposable income (as shown by Table) between 2019 and 2020. This is mainly driven by Personal Income Tax Allowance announced to be frozen at 2019 nominal value (decreasing in real value) as well as frozen high tax thresholds at 2019 value implying real tax increases for all earners.

On the other hand, state pension rising slightly more than inflation thanks to the triple-lock indexation, means that there will continue to be small but positive real changes to Public Pension across the income distribution.

From 2020 all means-tested benefits should restart increasing after their values have been frozen (in nominal value) for the last four years. This will be positive for all benefit receivers. The analysis shown here also capture the effect of a higher share of claimants transferred to Universal Credit: UC will replace six working-age means-tested benefits and will require a single application for it. Although in general the amount of the "new" benefit will more or less match the sum of the six benefits it replaces (for people who were already claiming all the benefits they were entitled to), some claimants are expected to gain from increase take-up (i.e. if someone was claiming only few of the six means-tested benefits replaced by UC, under the new system they would be considered for all six and be paid the full amount they are entitled to, which may include more than what they were claiming under the old system). This is shown in Figure 2 as an average gain (0.09 per cent) from means-tested benefits for the bottom income group.

Table 2 Policy Effects 2019-20, using CPI indexation, %

Decile	Original income	Public pensions	Means-tested benefits	Non means-tested benefits	Employee SIC	Self-employed SIC	Direct taxes	Disposable income
1	0.00	0.17	0.09	0.01	0.01	0.00	-0.07	0.20
2	0.00	0.13	-0.05	0.01	0.01	0.00	-0.10	0.00
3	0.00	0.13	0.02	0.01	0.01	0.00	-0.15	0.02
4	0.00	0.11	-0.03	0.01	0.02	0.00	-0.18	-0.07
5	0.00	0.09	-0.03	0.01	0.02	0.00	-0.20	-0.11
6	0.00	0.07	-0.03	0.00	0.03	0.00	-0.23	-0.16
7	0.00	0.05	-0.10	-0.01	0.04	0.00	-0.25	-0.26
8	0.00	0.04	0.00	-0.02	0.05	0.00	-0.26	-0.19
9	0.00	0.03	0.01	-0.01	0.07	0.00	-0.30	-0.20
10	0.00	0.02	-0.03	0.00	0.09	0.01	-0.35	-0.27
Total	0.00	0.06	-0.02	0.00	0.05	0.00	-0.25	-0.17

Notes: shown as a percentage change in mean equivalised household disposable income by income component and income decile group. Income decile groups are based on equivalised household disposable income in 2019, using the modified OECD equivalence scale. Each policy system has been applied to the same input data, deflating monetary parameters of 2020 policies by *projected* Eurostat's Harmonized Index of Consumer Prices (HICP).

Figure 2 Policy Effects 2019-20, using CPI indexation (CPI=1.019), %
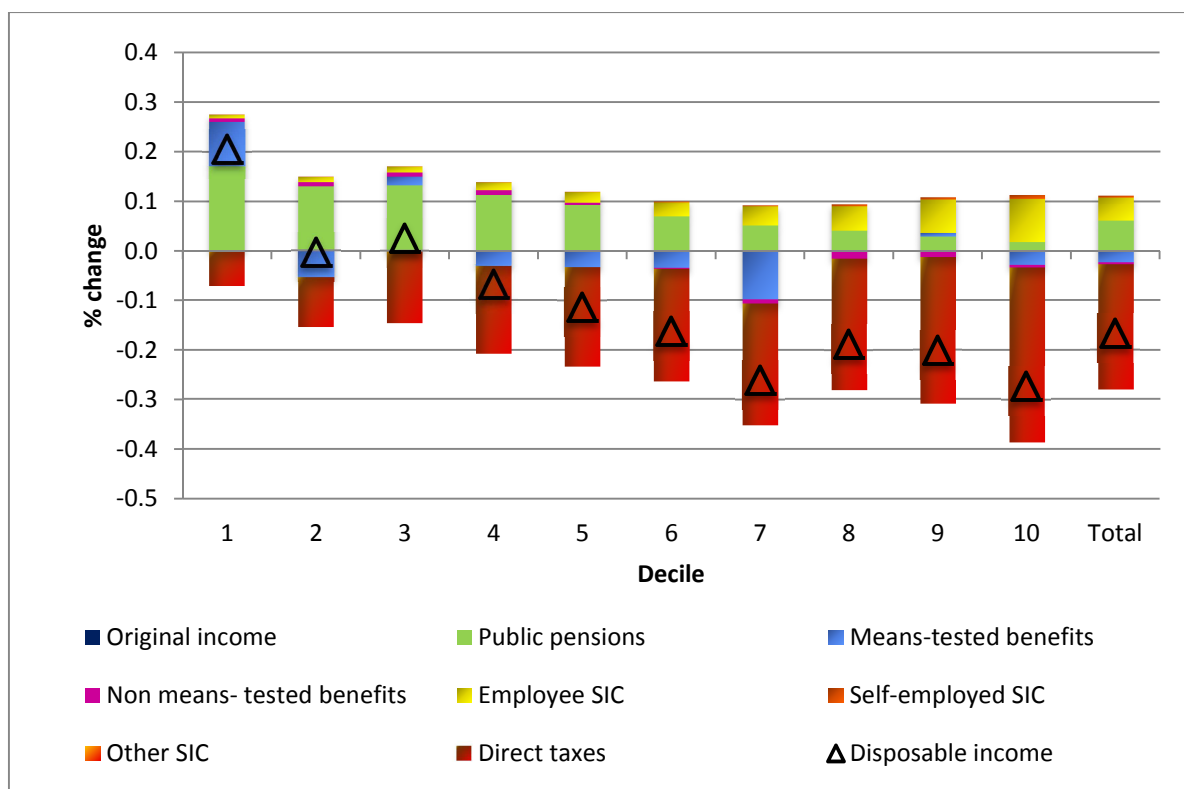
7.3   Annex 3: Validation Tables

Table 4.4 Tax benefit instruments included but not simulated in EUROMOD -Number of recipients/ payers (in thousands)

	EUROMOD					External					Ratio				
	2016	2017	2018	2019	2020	2016/17	2017/18	2018/19	2019/20	2020/21	2016	2017	2018	2019	2020
Benefits															
Incapacity benefit+ c-ESA	299	274	199	199	199	486	462	409	357	349	0.62	0.59	0.49	0.56	0.57
Incapacity benefit	62	39	0	0	0	3	2	0	0	0	20.67	19.50	N/A	N/A	N/A
Contributory-ESA	237	235	199	199	199	2381	2326	2173	2341	2323	0.10	0.10	0.09	0.09	0.09
Retirement Pension	11,619	11,555	11,302	11,302	11,302	11145	10995	10570	10100	9726	1.04	1.05	1.07	1.12	1.16
Second State Pension	7,869	8,071	8,071	8,071	8,071	10250	9876	9472	9147	8813	0.77	0.82	0.85	0.88	0.92
Bereavement Benefits	83	153	153	153	153	91	87	100	96	89	0.91	1.76	1.53	1.59	1.72
Attendance Allowance	811	801	801	801	801	1445	1435	1440	1451	1467	0.56	0.56	0.56	0.55	0.55
Disability Living Allowance (either part)	2,260	1,695	1,695	1,695	1,695	2631	2127	1762	1563	1322	0.86	0.80	0.96	1.08	1.28
Severe Disablement Allowance	23	25	25	25	25	59	35	30	28	27	0.39	0.71	0.83	0.89	0.93
Carer's Allowance	625	759	759	759	759	798	826	824	830	869	0.78	0.92	0.92	0.91	0.87
Industrial Injuries Disablement Allowance	184	154	154	154	154	307	302	296	291	286	0.60	0.51	0.52	0.53	0.54
Maternity allowances	25	35	35	35	35	61	59	61	62	63	0.41	0.59	0.57	0.56	0.56
War Pension and allowances	82	68	68	68	68	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statutory Maternity Pay	167	165	165	165	165	264	262	267	269	270	0.63	0.63	0.62	0.61	0.61
Personal Independence Payment (PIP)	1,368	2,000	2,000	2,000	2,000	588	1043	1536	1892	2161	2.33	1.92	1.30	1.06	0.93
Taxes and Social Insurance contributions															
Council tax (payers)	26,693	26,593	26,593	26,593	26,593	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Sources: Unless otherwise specified: Department for Work and Pensions https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2018

Table 4.5 Tax benefit instruments included but not simulated in EUROMOD -Annual amounts (in mil. GBP)

	EUROMOD					External					Ratio				
	2016	2017	2018	2019	2020	2016/17	2017/18	2018/19	2019/20	2020/21	2016	2017	2018	2019	2020
Benefits															
Incapacity benefit+ c-ESA	1,411	1,223	1,155	1,183	1,208	4,702	4,720	4,548	4,576	4,517	0.30	0.26	0.25	0.26	0.27
Incapacity benefit	353	186	0	0	0	15	9	3	1	1	23.70	20.83	0.00	0.00	0.00
c-ESA	1,058	1,037	1,155	1,183	1,208	4,687	4,711	4,545	4,575	4,516	0.23	0.22	0.25	0.26	0.27
Retirement Pension	65,611	67,404	67,822	69,573	71,592	68,937	68,236	67,583	66,881	66,274	0.95	0.99	1.00	1.04	1.08
Second State Pension	14,970	15,961	16,318	16,657	16,973	18,135	17,985	18,210	18,281	18,130	0.83	0.89	0.90	0.91	0.94
Bereavement Benefits	455	887	913	935	955	557	503	461	423	386	0.82	1.76	1.98	2.21	2.48
Attendance Allowance	2,928	2,960	3,049	3,122	3,187	5,483	5,529	5,675	5,887	6,067	0.53	0.54	0.54	0.53	0.53
Disability Living Allowance (either part)	9,410	7,340	7,561	7,743	7,905	11,514	9,380	8,099	7,346	6,300	0.82	0.78	0.93	1.05	1.25
Severe Disablement Allowance	99	109	112	115	117	234	120	98	94	90	0.42	0.91	1.14	1.23	1.30
Carer's Allowance	2,010	2,547	2,624	2,719	2,775	2,667	2,830	2,869	2,982	3,175	0.75	0.90	0.91	0.91	0.87
Industrial Injuries Disablement Allowance	490	458	472	483	493	861	840	839	848	850	0.57	0.54	0.56	0.57	0.58
Maternity allowances	160	252	259	266	271	437	427	429	448	464	0.37	0.59	0.60	0.59	0.58
War Pension and allowances	550	361	372	380	388	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Statutory Maternity Pay	1,126	1,202	1,238	1,268	1,294	2,385	2,469	2,579	2,642	2,724	0.47	0.49	0.48	0.48	0.47
Personal Independence Payment (PIP)	3,988	6,010	6,191	6,341	6,474	3,005	5,160	8,650	1,0608	1,3075	1.33	1.16	0.72	0.60	0.50
Taxes and Social Insurance contributions															
Council tax (payers)	33,257	34,547	36,178	37,900	38,664	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Sources: Unless otherwise specified: Department for Work and Pensions https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2018

External statistics for War Pension and allowances and Council Tax are no longer available

Table 4.6a Tax benefit instruments simulated in EUROMOD -Number of recipients/ payers (in thousands) - full take up

Benefits	Unit	EUROMOD					External					Ratio				
		2016	2017	2018	2019	2020	2016/17	2017/18	2018/19	2019/20	2020/21	2016	2017	2018	2019	2020
Child Benefit	Children	12,456	12,316	12,257	12,237	12,143	12,877	12,847	12,746	N/A	N/A	0.97	0.96	0.96	N/A	N/A
	Families	7,272	7,163	7,135	7,122	7,065	7,396	7,377	7,326	N/A	N/A	0.98	0.97	0.97	N/A	N/A
Sure Maternity Grant	Families	164	166	164	125	129	55	N/A	N/A	N/A	N/A	2.98	N/A	N/A	N/A	N/A
Scottish Best Start Grant	Families	--	--	--	110	109	N/A	N/A	N/A	43	N/A	N/A	N/A	N/A	2.59	N/A
Working Tax credit (all)	Families	2,304	2,109	1,778	1,262	871	2,055	1,898	N/A	N/A	N/A	1.12	1.11	N/A	N/A	N/A
Child Tax Credit (all)	Families	3,662	3,351	2,870	2,109	1,522	2,457	2,320	N/A	N/A	N/A	1.49	1.44	N/A	N/A	N/A
Both CTC and WTC	Families	1,357	1,260	1,095	805	572	1,654	1,556	N/A	N/A	N/A	0.82	0.81	N/A	N/A	N/A
Either CTC or WTC	Families	4,609	4,199	3,554	2,566	1,821	2,858	2,662	N/A	N/A	N/A	1.61	1.58	N/A	N/A	N/A
Without children (WTC only)	Families	947	848	684	457	299	401	342	N/A	N/A	N/A	2.36	2.48	N/A	N/A	N/A
Job Seekers contributory	Families	70	44	44	44	44	77	65	47	86	93	0.91	0.68	0.94	0.51	0.47
Income Support+ib-JSA	Families	2,063	1,977	1,724	1,295	919	1,062	923	715	1,121	1,115	1.94	2.14	2.41	1.16	0.82
Ib-ESA	Families	1,515	1,334	1,260	895	642	1,381	1,335	1,222	1,389	1,390	1.10	1.00	1.03	0.64	0.46
Income Support+ib-JSA+ib-ESA	Families	3,578	3,311	2,984	2,189	1,561	2,443	2,258	1,937	2,510	2,505	1.46	1.47	1.54	0.87	0.62
Income Support lone parents only	Families	478	418	356	264	174	395	380	317	355	333	1.21	1.10	1.12	0.74	0.52
Universal Credit	Families	351	642	1,466	2,946	4,141	373	627	1,188	N/A	N/A	0.94	1.02	1.23	N/A	N/A
Pension credit - any	Families	2,667	2,684	2,530	2,491	2,466	1,903	1,792	1,638	1,538	1,466	1.40	1.50	1.54	1.62	1.68
Pension Credit GC only	Families	1,378	1,333	1,197	1,166	1,146	918	884	804	755	731	1.50	1.51	1.49	1.54	1.57
Pension Credit GC+SC	Families	719	713	676	694	695	646	599	541	508	488	1.11	1.19	1.25	1.37	1.42
Pension Credit SC only	Families	570	638	658	630	625	339	309	293	274	247	1.68	2.06	2.25	2.30	2.53
Housing benefit: total	Hlds	5,155	4,933	4,396	3,560	2,912	4,594	4,371	3,981	4,476	4,437	1.12	1.13	1.10	0.80	0.66
Council tax benefit	Hlds	7,625	7,469	7,435	7,452	7,434	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Winter fuel payment	Hlds	12,786	12,282	11,591	11,591	11,591	12,025	11,808	11,573	11,399	11,265	1.06	1.04	1.00	1.02	1.03

Benefit cap (HB)	Families	30	126	105	69	52	20	69	61	50	N/A	1.50	1.83	1.73	1.39	N/A
Benefit cap (UC)	Families	2	12	36	60	90	0.3	3	6	26	N/A	5.88	3.56	5.63	2.34	N/A
Taxes and Social Insurance contributions																
Income tax	Ind.	29,548	29,534	29,542	29,183	29,590	31,200	31,300	31,700	31,400	N/A	0.95	0.94	0.93	0.93	N/A
Basic rate	Ind.	24,884	25,032	22,894	22,920	23,080	25,900	26,100	26,200	26,200	N/A	0.96	0.96	0.87	0.87	N/A
Higher rate	Ind.	4,342	4,255	4,299	3,947	4,177	4,410	4,210	4,260	3,850	N/A	0.98	1.01	1.01	1.03	N/A
Additional rate	Ind.	322	247	277	301	315	356	380	410	438	N/A	0.90	0.65	0.68	0.69	N/A
SIC Employees (Class 1)	Ind.	22,403	22,869	22,949	22,977	23,082	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC Self employed (Class 2 + any Class4)	Ind.	3,125	3,200	3,272	3,213	3,267	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC Employees & Self-Employed	Ind.	25,528	26,069	26,221	26,190	26,349	32,390	32,710	33,010	N/A	N/A	0.79	0.80	0.79	N/A	N/A

Sources: Unless otherwise specified: Department for Work and Pensions https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2018 and OBR Economic and Fiscal Outlook March 2019 https://obr.uk/efo/economic-fiscal-outlook-march-2019/

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Benefit cap statistics https://www.gov.uk/government/statistics/benefit-cap-number-of-households-capped-to-may-2019

 Income Tax Statistics and Distributions https://www.gov.uk/government/collections/income-tax-statistics-and-distributions

Note: Income Support also takes into account JSA means tested; ib-JSA is effectively simulated as part of IS in EUROMOD

Table 4.6b Tax benefit instruments simulated in EUROMOD -Number of recipients/ payers (in thousands) - partial take up

		EUROMOD					External					Ratio				
		2016	2017	2018	2019	2020	2016/17	2017/18	2018/19	2019/20	2020/21	2016	2017	2018	2019	2020
Benefits	**Unit**															
Child Benefit	Children	12,456	12,316	12,257	12,237	12,237	12,877	12,847	12,746	N/A	N/A	0.97	0.96	0.96	N/A	N/A
	Families	7,272	7,163	7,135	7,122	7,122	7,396	7,377	7,326	N/A	N/A	0.98	0.97	0.97	N/A	N/A
Sure Maternity Grant	Families	136	140	137	101	101	55	N/A	N/A	N/A	N/A	2.47	N/A	N/A	N/A	N/A
Scottish Best Start Grant	Families	--	--	--	88	88	N/A	N/A	N/A	43	N/A	N/A	N/A	N/A	2.07	N/A
Working Tax credit (all)	Families	1,393	1,259	986	611	611	2,055	1,898	2,239	N/A	N/A	0.68	0.66	0.44	N/A	N/A
Child Tax Credit (all)	Families	2,941	2,662	2,200	1,459	1,459	2,457	2,320	2,564	N/A	N/A	1.20	1.15	0.86	N/A	N/A
Both CTC and WTC	Families	1,126	1,046	892	611	611	1,654	1,556	1,759	N/A	N/A	0.68	0.67	0.51	N/A	N/A
Either CTC or WTC	Families	3,208	2,875	2,294	1,459	1,459	2,858	2,662	3,044	N/A	N/A	1.12	1.08	0.75	N/A	N/A
Without children (WTC only)	Families	267	213	94	0	0	401	342	480	N/A	N/A	0.67	0.62	0.20	N/A	N/A
Job Seekers contributory	Families	70	44	44	44	44	77	65	47	86	93	0.91	0.68	0.94	0.51	0.47
Income Support+ibJSA	Families	1,682	1,660	1,397	971	971	1,062	923	715	1,121	1,115	1.58	1.80	1.95	0.87	0.87
ibESA	Families	1,233	1,078	975	609	609	1,381	1,335	1,222	1,389	1,390	0.89	0.81	0.80	0.44	0.44
Income Support+ibJSA+ibESA	Families	2,915	2,738	2,372	1,580	1,580	2,443	2,258	1,937	2,510	2,505	1.19	1.21	1.22	0.63	0.63
Income Support lone parents only	Families	410	383	320	228	228	395	380	317	355	333	1.04	1.01	1.01	0.64	0.68
Universal Credit	Families	351	642	1,466	2,926	2,926	373	627	1,188	N/A	N/A	0.94	1.02	1.23	N/A	N/A
Pension credit - any	Families	1,612	1,624	1,541	1,490	1,490	1,903	1,792	1,638	1,538	1,466	0.85	0.91	0.94	0.97	1.02
Pension Credit GC only	Families	890	848	777	746	746	918	884	804	755	731	0.97	0.96	0.97	0.99	1.02
Pension Credit GC+SC	Families	475	446	435	437	437	646	599	541	508	488	0.74	0.74	0.80	0.86	0.90
Pension Credit SC only	Families	246	330	330	307	307	339	309	293	274	247	0.73	1.07	1.13	1.12	1.24
Housing benefit: total	Hlds	4,067	3,812	3,315	2,506	2,506	4,594	4,371	3,981	4,476	4,437	0.89	0.87	0.83	0.56	0.56
Council tax benefit	Hlds	5,394	5,322	5,296	5,257	5,257	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Winter fuel payment	Hlds	12,786	12,282	11,591	11,591	11,591	12,025	11,808	11,573	11,399	11,265	1.06	1.04	1.00	1.02	1.03
Benefit cap (HB)	Families	20	111	89	54	54	20	69	61	50	N/A	1.00	1.61	1.47	1.09	N/A

Benefit cap (UC)	Families	2	12	36	60	60	0.3	3	6	26	N/A	5.88	3.56	5.63	2.34	N/A
Benefit cap (Any)	Families	22	123	125	114	114	20	72	67	75	N/A	1.08	1.70	1.87	1.51	N/A
Taxes and Social Insurance contributions															
Income tax	Ind.	29,548	29,534	29,542	29,183	29,183	31,200	31,300	31,700	31,400	N/A	0.95	0.94	0.93	0.93	N/A
Basic rate	Ind.	24,884	25,032	22,894	22,920	22,920	25,900	26,100	26,200	26,200	N/A	0.96	0.96	0.87	0.87	N/A
Higher rate	Ind.	4,342	4,255	4,299	3,947	3,947	4,410	4,210	4,260	3,850	N/A	0.98	1.01	1.01	1.03	N/A
Additional rate	Ind.	322	247	277	301	301	356	380	410	438	N/A	0.90	0.65	0.68	0.69	N/A
SIC Employees (Class 1)	Ind.	22,403	22,869	22,949	22,977	22,977	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC Self employed (Class 2 + any Class4)	Ind.	3,125	3,200	3,272	3,213	3,213	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC Employees and Self-Employed	Ind.	25,528	26,069	26,221	26,190	26,190	32,390	32,710	33,010	N/A	N/A	0.79	0.80	0.79	N/A	N/A

Sources: Unless otherwise specified: Department for Work and Pensions https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2018 and OBR Economic and Fiscal Outlook March 2019 https://obr.uk/efo/economic-fiscal-outlook-march-2019/

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Income Tax Statistics and Distributions https://www.gov.uk/government/collections/income-tax-statistics-and-distributions

Note: Income Support also takes into account JSA means tested; ib-JSA is effectively simulated as part of IS in EUROMOD

Table 4.7a Tax benefit instruments simulated in EUROMOD -Annual amounts (in mil. GBP) - full take up

	EUROMOD					External					Ratio				
	2016	2017	2018	2019	2020	2016/17	2017/18	2018/19	2019/20	2020/21	2016	2017	2018	2019	2020
Benefits															
Child Benefit	11,402	11,267	11,213	11,162	11,300	11,640	11,600	11,566	11,583	11,861	0.98	0.97	0.97	0.96	0.95
Sure Maternity Grant	84	85	84	64	66	28	N/A	N/A	N/A	N/A	2.01	N/A	N/A	N/A	N/A
Scottish Best Start Grant	--	--	--	44	44	N/A	N/A	N/A	13	N/A	N/A	N/A	N/A	3.42	N/A
Working Tax credit (all)	5,599	4,953	4,235	3,040	2,208	6,299	5,796	N/A	N/A	N/A	0.89	0.85	N/A	N/A	N/A
Child Tax Credit (all)	17,853	16,575	14,346	10,099	7,290	20,726	19,741	N/A	N/A	N/A	0.86	0.84	N/A	N/A	N/A
CTC and WTC	23,452	21,528	18,581	13,139	9,498	27,429	25,940	22,845	24,817	24,812	0.86	0.83	0.81	0.53	0.38
Without children (WTC only)	1,729	1,454	1,209	822	592	931	818	N/A	N/A	N/A	1.86	1.78	N/A	N/A	N/A
Jobseeker's Allowance (contributory)	257	161	161	161	164	264	224	163	301	329	0.97	0.72	0.99	0.54	0.50
Income Support+ibJSA	7,631	7,386	6,403	4,800	3,449	3,843	3,581	2,976	4,279	4,365	1.99	2.06	2.15	1.12	0.79
ibESA	9,138	8,024	7,689	5,437	3,979	10,143	10,642	10,711	11,307	11,025	0.90	0.75	0.72	0.48	0.36
Income Support+ibJSA+ibESA	16,769	15,410	14,092	10,237	7,428	13,987	14,223	13,687	15,585	15,390	1.20	1.08	1.03	0.66	0.48
Income support lone parents only	1,845	1,619	1,389	1,021	659	1,403	1,350	1,124	1,279	1,219	1.31	1.20	1.24	0.80	0.54
Universal Credit	3,191	5,237	11,750	23,817	33,960	1,585	3,322	8,116	N/A	N/A	2.01	1.58	1.45	N/A	N/A
Pension Credit: Guarantee Credit	6,580	6,342	5,535	5,554	5,561	5,244	4,973	4,672	4,578	4,456	1.25	1.28	1.18	1.21	1.25
Pension Credit: Savings Credit	527	544	547	556	571	422	395	387	373	350	1.25	1.38	1.41	1.49	1.63
Pension Credit total	7,107	6,886	6,082	6,110	6,132	5,666	5,368	5,059	4,951	4,806	1.25	1.28	1.20	1.23	1.28
Housing benefit: total	22,575	21,280	18,554	14,908	12,121	23,441	22,301	20,775	23,412	23,769	0.96	0.95	0.89	0.64	0.51
Council tax benefit	5,555	5,674	5,918	6,265	6,380	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Winter fuel payment	2,083	2,038	1,950	1,950	1,950	2,049	2,023	1,986	1,962	1,944	1.02	1.01	0.98	0.99	1.00
all IS+PC+ibJSA	23,876	22,297	20,174	16,347	13,560	19,652	19,591	18,746	20,537	20,196	1.21	1.14	1.08	0.80	0.67
Benefit cap (HB)	85	401	342	237	177	N/A	N/A	752	596	N/A	N/A	N/A	0.45	0.40	N/A
Benefit cap (UC)	25	29	100	171	300	N/A	N/A	48	308	N/A	N/A	N/A	2.09	0.55	N/A
Taxes and Social Insurance contributions															
Income tax	159,152	152,244	158,97	161,23	170,092	164,620	169,600	176,750	180,320	N/A	0.97	0.90	0.90	0.89	N/A

			0	6											
Basic rate	58,590	60,748	57,347	60,292	62,231	57,300	59,800	61,900	65,100	N/A	1.02	1.02	0.93	0.93	N/A
Higher rate	68,203	68,788	70,473	67,710	72,719	64,900	64,500	66,600	63,400	N/A	1.05	1.07	1.06	1.07	N/A
Additional rate	32,360	22,708	24,599	26,658	28,388	51,500	56,400	60,800	64,600	N/A	0.63	0.40	0.40	0.41	N/A
SIC Employees (Class 1) + S/empl (class 2 & 4)	56,059	59,143	61,038	63,842	65,374	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC Employers	70,387	71,883	74,035	76,239	78,658	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC total (any SIC)	126,446	131,026	135,073	140,081	144,032	124,469	130,931	136,646	N/A	N/A	1.02	1.00	0.99	N/A	N/A

Note: Income Support also takes into account JSA means tested; ib-ESA is effectively simulated as part of IS in EUROMOD

Sources: Unless otherwise specified: Department for Work and Pensions https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2018

Best Start Grant https://www2.gov.scot/Topics/Statistics/Browse/Social-Welfare/SocialSecurityforScotland/BSGJune2019

Income tax: HMRC statistics https://www.gov.uk/government/statistics/income-tax-liabilities-statistics-tax-year-2014-to-2015-to-tax-year-2017-to-2018 . Child tax credit and working tax credit: HMRC statisti

Table 4.7b Tax benefit instruments simulated in EUROMOD -Annual amounts (in mil. GBP) - partial take up

	EUROMOD					External					Ratio				
	2016	2017	2018	2019	2020	2016/17	2017/18	2018/19	2019/20	2020/21	2016	2017	2018	2019	2020
Benefits															
Child Benefit	11,402	11,267	11,213	11,162	11,162	11,640	11,600	11,566	11,583	11,861	0.98	0.97	0.97	0.96	0.94
Sure Maternity Grant	70	72	70	52	52	28	N/A	N/A	N/A	N/A	2.51	N/A	N/A	N/A	N/A
Scottish Best Start Grant	--	--	--	35	35	N/A	N/A	N/A	13	N/A	N/A	N/A	N/A	2.72	N/A
Working Tax credit (all)	3,778	3,297	2,669	1,739	1,739	6,299	5,796	N/A	N/A	N/A	0.60	0.57	N/A	N/A	N/A
Child Tax Credit (all)	14,422	13,208	11,102	7,179	7,179	20,726	19,741	N/A	N/A	N/A	0.70	0.67	N/A	N/A	N/A
CTC and WTC	18,201	16,505	13,771	8,918	8,918	27,429	25,940	22,845	24,817	24,812	0.66	0.64	0.60	0.36	0.36
Without children (WTC only)	501	332	150	0	0	931	818	N/A	N/A	N/A	0.54	0.41	N/A	N/A	N/A
Jobseeker's Allowance (contributory)	257	161	161	161	161	264	224	163	301	329	0.97	0.72	0.99	0.54	0.49
Income Support+ibJSA	6,274	6,289	5,259	3,660	3,660	3,843	3,581	2,976	4,279	4,365	1.63	1.76	1.77	0.86	0.84
ibESA	7,438	6,485	5,941	3,678	3,678	10,143	10,642	10,711	11,307	11,025	0.73	0.61	0.55	0.33	0.33
Income Support+JSAinc+ibESA	13,711	12,774	11,200	7,338	7,338	13,987	14,223	13,687	15,585	15,390	0.98	0.90	0.82	0.47	0.48
Income support lone parents only	1,579	1,490	1,260	893	893	1,403	1,350	1,124	1,279	1,219	1.13	1.10	1.12	0.70	0.73
Universal Credit	3,191	5,237	11,750	23,755	23,755	1,585	3,322	8,116	N/A	N/A	2.01	1.58	1.45	N/A	N/A
Pension Credit Guarantee Credit	4,261	3,945	3,601	3,556	3,556	5,244	4,973	4,672	4,578	4,456	0.81	0.79	0.77	0.78	0.80
Pension Credit Savings Credit	305	319	319	315	315	422	395	387	373	350	0.72	0.81	0.82	0.84	0.90
Pension Credit total	4,566	4,264	3,920	3,871	3,871	5,666	5,368	5,059	4,951	4,806	0.81	0.79	0.77	0.78	0.81
Housing benefit: total	18,043	16,985	14,482	10,892	10,892	23,441	22,301	20,775	23,412	23,769	0.77	0.76	0.70	0.47	0.46
Council tax benefit	3,984	4,046	4,226	4,442	4,442	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Winter fuel payment	2,083	2,038	1,950	1,950	1,950	2,049	2,023	1,986	1,962	1,944	1.02	1.01	0.98	0.99	1.00
all IS+PC+JSAinc	18,278	17,038	15,120	11,209	11,209	19,652	19,591	18,746	20,537	20,196	0.93	0.87	0.81	0.55	0.56
Benefit cap (HB)	55	333	278	177	177	N/A	N/A	752	596	N/A	N/A	N/A	0.37	0.30	N/A

Benefit cap (UC)	25	29	100	171	171	N/A	N/A	48	308	N/A	N/A	N/A	2.09	0.55	N/A
Benefit cap (Total)	80	362	378	348	348	N/A	N/A	799	905	N/A	N/A	N/A	0.47	0.38	N/A
Taxes and Social Insurance contributions															
Income tax	159,152	152,244	158,970	161,236	161,236	164,620	169,600	176,750	180,320	N/A	0.97	0.90	0.90	0.89	N/A
Basic rate	58,590	60,748	57,347	60,292	60,292	57,300	59,800	61,900	65,100	N/A	1.02	1.02	0.93	0.93	N/A
Higher rate	68,203	68,788	70,473	67,710	67,710	64,900	64,500	66,600	63,400	N/A	1.05	1.07	1.06	1.07	N/A
Additional rate	32,360	22,708	24,599	26,658	26,658	51,500	56,400	60,800	64,600	N/A	0.63	0.40	0.40	0.41	N/A
SIC Employees (Class 1) + S/employed (class 2 & 4)	56,059	59,143	61,038	63,842	63,842	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC Employers	70,387	71,883	74,035	76,239	76,239	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SIC total (any SIC)	126,446	131,026	135,073	140,081	140,081	124,469	130,931	136,646	N/A	N/A	1.02	1.00	0.99	N/A	N/A

Sources: Unless otherwise specified: Department for Work and Pensions https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2018 Income tax: HMRC statistics https://www.gov.uk/government/statistics/income-tax-liabilities-statistics-tax-year-2014-to-2015-to-tax-year-2017-to-2018 Child tax credit and working tax credit: HMRC statistics https://www.gov.uk/government/statistics/child-and-working-tax-credits-statistics-finalised-annual-awards-2016-to-2017 National Insurance Contributions: ONS Blue Book Table 5.2.4s

Table 4.8a Distribution of equivalised disposable income (Full take-up assumption)

	EUROMOD					External (FRS)		External (HBAI)					Ratio (EM/FRS)		Ratio (EM/HBAI)				
	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020
Gini	0.29	0.28	0.29	0.29	0.29	0.31	0.31	0.34	0.34	N/A	N/A	N/A	0.91	0.93	0.85	0.83	N/A	N/A	N/A
Mean	1,749	1,772	1,824	1,878	1,926	1,788	1,821	1,759	1,771	N/A	N/A	N/A	0.99	1.00	0.99	1.00	N/A	N/A	N/A
Median	1,478	1,514	1,555	1,602	1,640	1,530	1,571	1,465	1,465	N/A	N/A	N/A	0.99	0.99	1.01	1.03	N/A	N/A	N/A
Decile medians (£/month equivalised)																			
D1	740	753	760	769	782	612	609	558	552	N/A	N/A	N/A	1.23	1.25	1.33	1.36	N/A	N/A	N/A
D2	940	954	964	975	993	897	900	855	838	N/A	N/A	N/A	1.06	1.07	1.10	1.14	N/A	N/A	N/A
D3	1,069	1,099	1,115	1,134	1,159	1,070	1,092	1,023	1,023	N/A	N/A	N/A	1.03	1.02	1.05	1.07	N/A	N/A	N/A
D4	1,211	1,252	1,274	1,308	1,340	1,239	1,271	1,184	1,190	N/A	N/A	N/A	1.01	1.00	1.02	1.05	N/A	N/A	N/A
D5	1,382	1,423	1,460	1,499	1,537	1,426	1,465	1,364	1,372	N/A	N/A	N/A	1.00	1.00	1.01	1.04	N/A	N/A	N/A
D6	1,577	1,618	1,664	1,714	1,757	1,636	1,681	1,566	1,560	N/A	N/A	N/A	0.99	0.99	1.01	1.04	N/A	N/A	N/A
D7	1,801	1,846	1,907	1,967	2,017	1,880	1,931	1,794	1,791	N/A	N/A	N/A	0.98	0.99	1.00	1.03	N/A	N/A	N/A
D8	2,079	2,133	2,210	2,284	2,344	2,167	2,242	2,063	2,077	N/A	N/A	N/A	0.98	0.99	1.01	1.03	N/A	N/A	N/A
D9	2,494	2,576	2,661	2,756	2,827	2,620	2,732	2,493	2,516	N/A	N/A	N/A	0.98	0.97	1.00	1.02	N/A	N/A	N/A
D10	3,553	3,565	3,724	3,854	3,955	3,706	3,799	3,574	3,568	N/A	N/A	N/A	0.96	0.98	0.99	1.00	N/A	N/A	N/A
Decile group share																			
D1	4.0	4.0	3.9	3.8	3.8	2.7	2.4	3.0	3.0	N/A	N/A	N/A	1.48	1.64	1.34	1.33	N/A	N/A	N/A
D2	5.4	5.4	5.3	5.2	5.2	5.1	5.1	5.0	4.0	N/A	N/A	N/A	1.06	1.04	1.07	1.35	N/A	N/A	N/A
D3	6.1	6.2	6.1	6.1	6.0	6.0	6.0	5.0	6.0	N/A	N/A	N/A	1.03	1.02	1.22	1.03	N/A	N/A	N/A
D4	6.9	7.1	7.0	7.0	7.0	6.9	6.9	7.0	7.0	N/A	N/A	N/A	1.02	1.01	0.99	1.01	N/A	N/A	N/A
D5	7.9	8.0	8.0	8.0	8.0	7.9	7.9	8.0	8.0	N/A	N/A	N/A	1.02	1.01	0.99	1.01	N/A	N/A	N/A
D6	9.0	9.1	9.1	9.1	9.1	9.1	9.1	9.0	9.0	N/A	N/A	N/A	1.01	1.01	1.00	1.01	N/A	N/A	N/A
D7	10.3	10.4	10.5	10.5	10.5	10.5	10.5	11.0	11.0	N/A	N/A	N/A	0.99	1.00	0.94	0.95	N/A	N/A	N/A
D8	11.9	12.1	12.1	12.2	12.2	12.3	12.3	11.0	11.0	N/A	N/A	N/A	0.98	0.98	1.08	1.10	N/A	N/A	N/A
D9	14.4	14.6	14.7	14.7	14.8	15.0	15.0	14.0	15.0	N/A	N/A	N/A	0.98	0.98	1.03	0.98	N/A	N/A	N/A
D10	24.0	23.0	23.3	23.5	23.5	24.0	24.0	27.0	27.0	N/A	N/A	N/A	0.96	0.97	0.89	0.85	N/A	N/A	N/A

Sources: HBAI statistics https://www.gov.uk/government/statistics/households-below-average-income-199495-to-201718

Table 4.8b Distribution of equivalised disposable income (Partial take-up assumption)

	EUROMOD					External (FRS)		External (HBAI)					Ratio (EM/FRS)		Ratio (EM/HBAI)				
	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020
Gini	0.31	0.30	0.30	0.31	0.31	0.31	0.31	0.34	0.34	N/A	N/A	N/A	0.96	0.98	0.90	0.88	N/A	N/A	N/A
Mean	1,716	1,740	1,794	1,849	1,849	1,788	1,821	1,759	1,771	N/A	N/A	N/A	0.97	0.99	0.98	0.98	N/A	N/A	N/A
Median	1,463	1,502	1,544	1,589	1,589	1,530	1,571	1,465	1,465	N/A	N/A	N/A	0.98	0.98	1.00	1.03	N/A	N/A	N/A
Decile medians (£/month equivalised)																			
D1	618	641	652	657	657	612	609	558	552	N/A	N/A	N/A	1.05	1.07	1.11	1.16	N/A	N/A	N/A
D2	880	890	903	913	913	897	900	855	838	N/A	N/A	N/A	0.99	1.00	1.03	1.06	N/A	N/A	N/A
D3	1,034	1,055	1,076	1,099	1,099	1,070	1,092	1,023	1,023	N/A	N/A	N/A	0.99	0.99	1.01	1.03	N/A	N/A	N/A
D4	1,183	1,225	1,251	1,286	1,286	1,239	1,271	1,184	1,190	N/A	N/A	N/A	0.99	0.98	1.00	1.03	N/A	N/A	N/A
D5	1,364	1,407	1,444	1,485	1,485	1,426	1,465	1,364	1,372	N/A	N/A	N/A	0.99	0.99	1.00	1.03	N/A	N/A	N/A
D6	1,567	1,609	1,657	1,704	1,704	1,636	1,681	1,566	1,560	N/A	N/A	N/A	0.98	0.99	1.00	1.03	N/A	N/A	N/A
D7	1,794	1,837	1,896	1,959	1,959	1,880	1,931	1,794	1,791	N/A	N/A	N/A	0.98	0.98	1.00	1.03	N/A	N/A	N/A
D8	2,074	2,131	2,207	2,283	2,283	2,167	2,242	2,063	2,077	N/A	N/A	N/A	0.98	0.98	1.01	1.03	N/A	N/A	N/A
D9	2,493	2,573	2,661	2,754	2,754	2,620	2,732	2,493	2,516	N/A	N/A	N/A	0.98	0.97	1.00	1.02	N/A	N/A	N/A
D10	3,549	3,565	3,724	3,853	3,853	3,706	3,799	3,574	3,568	N/A	N/A	N/A	0.96	0.98	0.99	1.00	N/A	N/A	N/A
Decile group share																			
D1	3.2	3.3	3.2	3.2	3.2	2.7	2.4	3	3	N/A	N/A	N/A	1.21	1.35	1.06	1.09	N/A	N/A	N/A
D2	5.1	5.1	5.0	4.9	4.9	5.0	4.9	5	4	N/A	N/A	N/A	1.02	1.02	1.02	1.27	N/A	N/A	N/A
D3	6.0	6.1	6.0	5.9	5.9	6.0	6.0	5	6	N/A	N/A	N/A	1.02	1.00	1.20	1.02	N/A	N/A	N/A
D4	6.9	7.0	7.0	7.0	7.0	6.9	7.0	7	7	N/A	N/A	N/A	1.02	1.00	0.98	1.01	N/A	N/A	N/A
D5	7.9	8.1	8.0	8.0	8.0	8.0	8.1	8	8	N/A	N/A	N/A	1.01	1.00	0.99	1.01	N/A	N/A	N/A
D6	9.1	9.2	9.2	9.2	9.2	9.2	9.3	9	9	N/A	N/A	N/A	1.01	1.00	1.02	1.03	N/A	N/A	N/A
D7	10.5	10.6	10.6	10.6	10.6	10.5	10.6	11	11	N/A	N/A	N/A	1.01	1.00	0.95	0.96	N/A	N/A	N/A
D8	12.1	12.3	12.3	12.4	12.4	12.2	12.4	11	11	N/A	N/A	N/A	1.01	1.00	1.10	1.12	N/A	N/A	N/A
D9	14.6	14.9	14.9	15.0	15.0	14.8	15.1	14	15	N/A	N/A	N/A	1.01	0.99	1.04	0.99	N/A	N/A	N/A
D10	24.5	23.4	23.7	23.8	23.8	24.8	24.4	27	27	N/A	N/A	N/A	0.95	0.97	0.91	0.87	N/A	N/A	N/A

Sources: HBAI statistics https://www.gov.uk/government/statistics/households-below-average-income-199495-to-201718

Table 4.9a Poverty rates by age (Full take-up assumption)

		EUROMOD					External (FRS)		External (HBAI)					Ratio (EM/FRS)		Ratio (EM/HBAI)				
		2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020
Median (£/month)																				
		1,478	1,514	1,555	1,602	1,640	1,530	1,571	1,465	1,465	N/A	N/A	N/A	0.97	0.96	1.01	1.03	N/A	N/A	N/A
Poverty risk: all																				
Total	50%	5.0	5.2	5.6	6.3	6.5	9.3	10.2	10.0	10.0	N/A	N/A	N/A	0.54	0.51	0.50	0.52	N/A	N/A	N/A
	60%	11.6	12.1	13.0	14.3	14.7	16.2	17.3	16.8	17.0	N/A	N/A	N/A	0.72	0.70	0.69	0.71	N/A	N/A	N/A
	70%	22.3	22.5	23.4	24.3	24.4	25.1	25.4	25.0	25.0	N/A	N/A	N/A	0.89	0.89	0.89	0.90	N/A	N/A	N/A
Poverty risk: children																				
	50%	3.1	4.0	4.5	6.2	6.8	10.9	12.9	11.0	12.0	N/A	N/A	N/A	0.29	0.31	0.28	0.33	N/A	N/A	N/A
	60%	12.3	12.9	14.8	18.1	19.3	20.3	22.9	19.0	22.0	N/A	N/A	N/A	0.60	0.56	0.64	0.59	N/A	N/A	N/A
	70%	28.7	28.9	30.7	32.8	33.1	33.0	33.6	33.0	33.0	N/A	N/A	N/A	0.87	0.86	0.87	0.88	N/A	N/A	N/A
Poverty risk: older people																				
	50%	6.1	6.6	7.0	7.3	7.0	8.4	9.5	10.0	10.0	N/A	N/A	N/A	0.72	0.70	0.61	0.66	N/A	N/A	N/A
	60%	13.5	15.0	15.3	15.7	15.8	16.8	17.5	17.0	18.0	N/A	N/A	N/A	0.81	0.85	0.80	0.83	N/A	N/A	N/A
	70%	24.5	25.9	26.5	27.1	27.2	26.7	27.9	28.0	28.0	N/A	N/A	N/A	0.92	0.93	0.87	0.92	N/A	N/A	N/A

Sources: HBAI statistics https://www.gov.uk/government/statistics/households-below-average-income-199495-to-201718

Table 4.9b Poverty rates by age (Partial take-up assumption)

		EUROMOD					External (FRS)		External (HBAI)					Ratio (EM/FRS)		Ratio (EM/HBAI)				
		2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020
Median (£/month)																				
		1,463	1,502	1,544	1,589	1,589	1,530	1,571	1,465	1,465	N/A	N/A	N/A	0.96	0.96	1.00	1.03	N/A	N/A	N/A
Poverty risk: all																				
Total	50%	8.2	8.6	8.9	9.4	9.4	9.3	10.2	10.0	10.0	N/A	N/A	N/A	0.88	0.84	0.82	0.86	N/A	N/A	N/A
	60%	14.9	15.7	16.4	17.3	17.3	16.2	17.3	16.8	17.0	N/A	N/A	N/A	0.92	0.91	0.88	0.92	N/A	N/A	N/A
	70%	24.3	24.8	25.5	25.9	25.9	25.1	25.4	25.0	25.0	N/A	N/A	N/A	0.97	0.98	0.97	0.99	N/A	N/A	N/A
Poverty risk: children																				
	50%	8.5	9.1	9.6	10.9	10.9	10.9	12.9	11.0	12.0	N/A	N/A	N/A	0.78	0.71	0.77	0.76	N/A	N/A	N/A
	60%	17.7	19.2	20.6	23.2	23.2	20.3	22.9	19.0	22.0	N/A	N/A	N/A	0.87	0.84	0.93	0.87	N/A	N/A	N/A
	70%	31.8	32.7	34.1	35.0	35.0	33.0	33.6	33.0	33.0	N/A	N/A	N/A	0.96	0.97	0.96	0.99	N/A	N/A	N/A
Poverty risk: older people																				
	50%	9.0	10.0	10.3	10.5	10.5	8.4	9.5	10.0	10.0	N/A	N/A	N/A	1.06	1.05	0.90	1.00	N/A	N/A	N/A
	60%	16.6	18.4	18.8	19.2	19.2	16.8	17.5	17.0	18.0	N/A	N/A	N/A	0.99	1.05	0.97	1.02	N/A	N/A	N/A
	70%	26.7	28.2	28.5	29.0	29.0	26.7	27.9	28.0	28.0	N/A	N/A	N/A	1.00	1.01	0.95	1.01	N/A	N/A	N/A

Sources: HBAI statistics https://www.gov.uk/government/statistics/households-below-average-income-199495-to-201718

Table 4.10a Poverty rates by gender and age groups comparing to EUROSTAT published statistics (Full take-up assumption)

	EUROMOD					External (FRS)		External (EUROSTAT)					Ratio (EM/FRS)		Ratio (EM/EUROSTAT)				
	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020
40% median HDI																			
Total	1.66	1.62	1.80	2.05	2.11	4.99	5.33	5.10	N/A	N/A	N/A	N/A	0.33	0.30	0.30	N/A	N/A	N/A	N/A
Males	1.95	1.69	1.85	2.11	2.19	5.11	5.32	5.00	N/A	N/A	N/A	N/A	0.38	0.32	0.32	N/A	N/A	N/A	N/A
Females	1.38	1.55	1.74	1.99	2.03	4.87	5.34	5.20	N/A	N/A	N/A	N/A	0.28	0.29	0.29	N/A	N/A	N/A	N/A
50% median HDI																			
Total	4.97	5.21	5.56	6.33	6.45	9.27	10.16	9.70	N/A	N/A	N/A	N/A	0.54	0.51	0.51	N/A	N/A	N/A	N/A
Males	5.01	5.00	5.39	6.07	6.21	9.30	10.02	9.40	N/A	N/A	N/A	N/A	0.54	0.50	0.50	N/A	N/A	N/A	N/A
Females	4.92	5.41	5.72	6.59	6.68	9.24	10.30	10.10	N/A	N/A	N/A	N/A	0.53	0.53	0.53	N/A	N/A	N/A	N/A
60% median HDI																			
Total	11.60	12.05	13.01	14.27	14.65	16.17	17.25	17.00	N/A	N/A	N/A	N/A	0.72	0.70	0.70	N/A	N/A	N/A	N/A
Males	11.23	11.53	12.48	13.69	14.09	15.66	16.68	16.10	N/A	N/A	N/A	N/A	0.72	0.69	0.69	N/A	N/A	N/A	N/A
Females	11.97	12.56	13.53	14.84	15.20	16.67	17.81	17.90	N/A	N/A	N/A	N/A	0.72	0.71	0.71	N/A	N/A	N/A	N/A
70% median HDI																			
Total	22.25	22.48	23.37	24.30	24.35	25.05	25.40	25.80	N/A	N/A	N/A	N/A	0.89	0.89	0.89	N/A	N/A	N/A	N/A
Males	21.30	21.49	22.34	23.23	23.18	24.04	24.50	24.80	N/A	N/A	N/A	N/A	0.89	0.88	0.88	N/A	N/A	N/A	N/A
Females	23.17	23.44	24.37	25.34	25.48	26.04	26.27	26.70	N/A	N/A	N/A	N/A	0.89	0.89	0.89	N/A	N/A	N/A	N/A
60% median HDI																			
0-15 years	11.87	12.69	14.69	18.22	19.48	20.26	23.02	21.10	N/A	N/A	N/A	N/A	0.59	0.55	0.55	N/A	N/A	N/A	N/A
16-24 years	13.68	15.12	15.68	16.48	16.80	17.01	18.48	21.10	N/A	N/A	N/A	N/A	0.80	0.82	0.82	N/A	N/A	N/A	N/A
25-49 years	9.32	9.24	10.30	11.40	11.71	13.89	14.61	13.70	N/A	N/A	N/A	N/A	0.67	0.63	0.63	N/A	N/A	N/A	N/A
50-64 years	12.04	11.94	12.90	13.22	13.16	14.90	15.37	16.60	N/A	N/A	N/A	N/A	0.81	0.78	0.78	N/A	N/A	N/A	N/A
65+ years	13.91	14.93	14.84	15.27	15.37	17.00	17.39	16.90	N/A	N/A	N/A	N/A	0.82	0.86	0.86	N/A	N/A	N/A	N/A

Sources: External statistics: Eurostat, online database

Table 4.10b Poverty rates by gender and age groups comparing to EUROSTAT published statistics (Partial take-up assumption)

	EUROMOD					External (FRS)		External (EUROSTAT)					Ratio (EM/FRS)		Ratio (EM/EUROSTAT)				
	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020	2016	2017	2016	2017	2018	2019	2020
40% median HDI																			
Total	4.45	4.12	4.31	4.56	4.56	4.99	5.33	5.10	N/A	N/A	N/A	N/A	0.89	0.77	0.81	N/A	N/A	N/A	N/A
Males	4.47	4.02	4.20	4.45	4.45	5.11	5.32	5.00	N/A	N/A	N/A	N/A	0.87	0.76	0.80	N/A	N/A	N/A	N/A
Females	4.42	4.22	4.42	4.67	4.67	4.87	5.34	5.20	N/A	N/A	N/A	N/A	0.91	0.79	0.81	N/A	N/A	N/A	N/A
50% median HDI																			
Total	8.18	8.55	8.86	9.38	9.38	9.27	10.16	9.70	N/A	N/A	N/A	N/A	0.88	0.84	0.88	N/A	N/A	N/A	N/A
Males	8.00	8.21	8.56	9.00	9.00	9.30	10.02	9.40	N/A	N/A	N/A	N/A	0.86	0.82	0.87	N/A	N/A	N/A	N/A
Females	8.35	8.88	9.14	9.76	9.76	9.24	10.30	10.10	N/A	N/A	N/A	N/A	0.90	0.86	0.88	N/A	N/A	N/A	N/A
60% median HDI																			
Total	14.85	15.67	16.42	17.33	17.33	16.17	17.25	17.00	N/A	N/A	N/A	N/A	0.92	0.91	0.92	N/A	N/A	N/A	N/A
Males	14.27	15.04	15.76	16.57	16.57	15.66	16.68	16.10	N/A	N/A	N/A	N/A	0.91	0.90	0.93	N/A	N/A	N/A	N/A
Females	15.41	16.28	17.05	18.07	18.07	16.67	17.81	17.90	N/A	N/A	N/A	N/A	0.92	0.91	0.91	N/A	N/A	N/A	N/A
70% median HDI																			
Total	24.25	24.81	25.46	25.85	25.85	25.05	25.40	25.80	N/A	N/A	N/A	N/A	0.97	0.98	0.96	N/A	N/A	N/A	N/A
Males	23.15	23.57	24.23	24.55	24.55	24.04	24.50	24.80	N/A	N/A	N/A	N/A	0.96	0.96	0.95	N/A	N/A	N/A	N/A
Females	25.33	26.02	26.66	27.12	27.12	26.04	26.27	26.70	N/A	N/A	N/A	N/A	0.97	0.99	0.97	N/A	N/A	N/A	N/A
60% median HDI																			
0-15 years	17.46	19.24	20.69	23.37	23.37	20.26	23.02	21.10	N/A	N/A	N/A	N/A	0.86	0.84	0.91	N/A	N/A	N/A	N/A
16-24 years	16.02	17.46	18.21	19.09	19.09	17.01	18.48	21.10	N/A	N/A	N/A	N/A	0.94	0.94	0.83	N/A	N/A	N/A	N/A
25-49 years	12.35	12.40	13.14	13.89	13.89	13.89	14.61	13.70	N/A	N/A	N/A	N/A	0.89	0.85	0.91	N/A	N/A	N/A	N/A
50-64 years	14.01	14.24	14.88	14.88	14.88	14.90	15.37	16.60	N/A	N/A	N/A	N/A	0.94	0.93	0.86	N/A	N/A	N/A	N/A
65+ years	16.99	18.46	18.60	18.95	18.95	17.00	17.39	16.90	N/A	N/A	N/A	N/A	1.00	1.06	1.09	N/A	N/A	N/A	N/A

Source: External statistics: Eurostat, online database

7.4 Annex 4: EUROMOD/UKMOD key income concepts

Annex 4 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 (non-existent in the UK): 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

Grouped in income lists:

Income from employment and self-employment: ils_earns = yem + yse

Original/market income: ils_origy = yem + yse + yiy + yot01 + ypr + ypp + yptot + yptmp – xmp

➢ **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

Grouped in income lists:

Employee National Insurance contributions: ils_sicee = tscee_s + tpcee_s

Self-employed National Insurance contributions: ils_sicse = tscse_s

Employer National Insurance contributions: ils_sicer = tscer_s

➢ **Taxes in more detail:**

Simulated:

Personal Income Tax: 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 & Job Seekers Allowance income-based (unless simulated separately): bsa_s

Income-based Jobseeker's Allowance: bunmt_s

Income-related Employment 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

Benefit cap (reducing Housing Benefit): brd_s

Benefit cap (reducing Universal Credit): brduc_s

Winter Fuel Allowance:boaht_s

Child Benefit: bch_s

Jobseeker's Allowance contributory: bunct_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

Contributory Employment 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

State pension: boact00

Occupational 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 + bsauc_s - 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

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 + bxcc_s - brd_s - brduc_s

Benefits by function:

Childbirth-related benefits: ils_b1_bcb = bmana + bmanc_s + bmaer + bmact_s + bpact_s + bmamt_s + bmascmt_s

Family-related benefits: ils_b1_bfa = ils_b1_bcb + bfamt_s + bch_s

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

Unemployment benefits: ils_b1_bun = bunct_s + bunmt_s + buntr

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