

EUROMOD

COUNTRY REPORT



UNITED KINGDOM (UK)

2009-2013

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EUROMOD is a tax-benefit microsimulation model for the European Union (EU) that enables researchers and policy analysts to calculate, in a comparable manner, the effects of taxes and benefits on household incomes and work incentives for the population of each country and for the EU as a whole.

EUROMOD has been enlarged to cover 27 Member States and is updated to recent policy systems using data from the European Union Statistics on Income and Living Conditions (EU-SILC) as the input database, supported by DG-EMPL of the European Commission.

This report documents the work done in one annual update for the United Kingdom. This work was carried out by the EUROMOD core developer team, based mainly in ISER at the University of Essex, in collaboration with a national team.

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The results presented in this report are derived using EUROMOD version G2.0. There may be minor differences between the results presented here and those obtained with G2.0 due to further improvements since the report was prepared. For more information, see: <http://www.iser.essex.ac.uk/research/euromod>

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This programme is managed by the Directorate-General for Employment, Social Affairs and Inclusion of the European Commission. It was established to finally support the implementation of the objectives of the European Union in the employment and social affairs area, as set out in the Social Agenda, and thereby contribute to the achievement of the Lisbon Strategy goals in these fields.

The seven-year Programme targets all stakeholders who can help shape the development of appropriate and effective employment and social legislation and policies, across the EU-27, EFTA-EEA and EU candidate and pre-candidate countries.

PROGRESS mission is to strengthen the EU contribution in support of Member States' commitment. PROGRESS is instrumental in providing analysis and policy advice on PROGRESS policy areas; monitoring and reporting on the implementation of EU legislation and policies in PROGRESS policy areas; promoting policy transfer, learning and support among Member States on EU objectives and priorities; and relaying the views of the stakeholders and society at large. For more information see: <http://ec.europa.eu/progress>

The information contained in this publication does not necessarily reflect the position or opinion of the European Commission.

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1. BASIC INFORMATION

1.1 Basic information about the tax-benefit system

- 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.
- 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.
- State pension age in 2009 was 60 for women and 65 for men; the state pension age for women started increasing gradually in 2010 and will reach 65 years old in 2020. After that, a phased increasing of the pension age for both men and women is planned.
- 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.
- The income tax system is an individual system, with spouses being assessed independently.
- 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.
- 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.
- 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).
- Generally, civil partners (same sex) are treated in the same way as married couples by the tax-benefit system.
- 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 index 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

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

earnings and some are not adjusted at all. Each year there may be announced departures from these rules, in either direction.

- 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 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.

1.2 Social Benefits

In the UK, social security benefits can be divided into three different types: 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 below). 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 below.

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; no additions for dependants; duration is up to six months only; small earnings disregard; only for those under state pension age; private pension income over £50 per week results in reductions to JSA payments; taxable. There is also a means-tested component to JSA (see 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 below) 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; younger 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 (in some cases) private pension 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 below). 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 1.3 below). 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.

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. DLA will be fully replaced by the Personal Independent Payment (PIP) by 2018. It was introduced across the country from summer 2013 for new claimants of DLA age 16-64. It is very similar to DLA as it is non means-tested and it has two components: a living component and a mobility one. However each component has only two rates.

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 under 65 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.

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 below). 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 below) 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, 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 above).

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 above).

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 (65+) pensioners 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

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

It is not taxable. 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 child care costs.

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 include (a) regulated payments which contribute to maternity, funeral and cold-weather fuel costs for certain families on low income; and (b) discretionary payments which take the form of either non-repayable grants or interest-free loans.

Universal Credit (UC), is due to be phased in from October 2013 and become fully functional from October 2017, and therefore does not affect the policy systems up to June 2013. However, 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:

² Specific hours limits may vary over time.

Statutory Sick Pay (SSP) and **Statutory Maternity Pay (SMP)** payable to employees by the employer for the first 28 weeks of sickness or 18 weeks of maternity leave. SSP is paid at a flat rate (most employers pay full wages for short-term sickness). For SMP there is a minimum flat rate payment and a higher rate (payable for only six weeks) equal to 90% of usual earnings. Both payments are (generally) treated as earnings by the rest of the tax-benefit system.

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.

1.3 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, the most important in terms of revenue-raising being 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 cars) 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 elected in 1977 or earlier to pay reduced contributions can still do so, so long as their contribution records have been maintained. This means they do not have to pay Class 2 contributions (if self-employed) and only 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.

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 2012.

Tax assessment is annual (April - March). Most income tax is collected at source, either through with-holding 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 above)

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.

Simulation of taxes and benefits in EUROMOD

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 2.1 shows which benefits are simulated (or otherwise treated) and Table 2.2 shows which taxes and contributions are simulated.

Table 2.1 Simulation of benefits in EUROMOD

	Variable name(s)	Treatment in EUROMOD					Why not fully simulated?
		2009	2010	2011	2012	2013	
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	boactm	I	I	I	I	I	Contribution history unknown
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

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	Variable name(s)	Treatment in EUROMOD					Why not fully simulated?
		2009	2010	2011	2012	2013	
Maternity Allowance	bmana	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 Pay	bmaer	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
Severe Disablement Allowance	bdisv	I	I	I	I	I	Insufficient information on disability
Carers Allowance	berdi	I	I	I	I	I	Insufficient information on disability
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	
Working Tax Credit	bwkmt_s	S	S	S	S	S	

	Variable name(s)	Treatment in EUROMOD					Why not fully simulated?
		2009	2010	2011	2012	2013	
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	
Council Tax Benefit	bmu_s	S	S	S	S	S	From 2013 administered at local level; assumed to operate as the 2012 national system ³ .
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

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.

³ 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 2013, with parameters updated in line with those for IS and HB. For the future we can try to take into account budget cuts due to austerities measures by reducing the amount of Council Tax benefit effectively available under the new schemes.

Table 2.2 Simulation of taxes and social contributions in EUROMOD

	Variable name(s)	Treatment in EUROMOD					Why not fully simulated?
		2009	2010	2011	2012	2013	
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” policy is *excluded* from the model’s scope as it is neither included in the microdata nor simulated by EUROMOD; “I”: *included* in the micro-data but not simulated; “PS” policy is *partially simulated* as some of its relevant rules are not simulated; “S” policy is *simulated* although some minor or very specific rules may not be simulated.

2.2 Order of simulation and interdependencies

Table 2.3 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 that depend on original income so 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*) and income tax (*tin_s*) have been done next.

The means-tested tax credits: Working Tax Credit - WTC (*bwkm_t_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 tax in line with the order of simulation in other countries.

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 Benefit (*bm_u_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.

Table 2.3 EUROMOD Spine: order of simulation

Policy	2009	2010	2011	2012	2013	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	n/a	n/a	n/a	n/a	on	DEF: Generate random number for bdisc_uk	---
Paa_uk	n/a	n/a	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	---
bdisc_uk	n/a	n/a	n/a	n/a	on	BEN: DLA reduce number of recipients (post 2011)	bdisc
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
tin_uk	on	on	on	on	on	TAX: personal income tax	tin_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: Social Assistance (income-related Employment Support Allowance)	bsadi_s
bho_uk	on	on	on	on	on	BEN: housing benefit and local housing allowance	bho_s
bmu_uk	on	on	on	on	on	BEN: council tax benefit	bmu_s
bcap_uk	n/a	n/a	n/a	n/a	on	BEN: Total benefits capped	brd_s

2.3 Policy switches

There are two switches used in the UK model.⁴ 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. Another 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.

2.4 National Minimum 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.

- *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 2009 the National Minimum Wage was £5.73 per hour for employees aged 22 and over, £4.77 for those aged 18-21 and £3.57 for those under 18 and not of compulsory school-age. For the rates for the other policy years, refer to the table below. There are no minimum wage regulations for children of compulsory school age.

Table 2.4 Rate of the National Minimum Wage from 2009 to 2013

As of...	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13
Fiscal year:	2009/10	2010/11	2011/12	2012/13	2013/14
	£ per hour	£ per hour	£ per hour	£ per hour	£ per hour
Aged 22+	5.73	5.80	5.93	6.08	6.19
Aged 18-21	4.77	4.83	4.92	4.98	4.98
Aged 16-17	3.53	3.57	3.64	3.68	3.68

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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.

⁴ 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.

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 60 (or the female state pension age which is higher in the later years) or over and is intended to cover extra heating costs for elderly people during winter months. The benefit is paid at household level (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 are aged over 80.

- *Eligibility conditions*

The general eligibility criterion is age though the amount varies according to both age and household composition – see below.

- *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 below.

Table 2.5 Winter Fuel Allowance benefit amounts and age conditions from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
Age threshold	60	60	60	61	61
	£ per year	£ per year	£ per year	£ per year	£ per year
At least one member of the HH is aged over the threshold	250	250	200	200	200
At least one member of the HH is aged 80 or over	400	400	300	300	300

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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

- *Eligibility conditions*

There are four main eligibility conditions for contributory JSA:

- **Age:** to be eligible for contributory JSA women need to be aged between 18-59 (or below the female state pension age) and men 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:** Another condition is that hours of work should be less than the weekly maximum equivalent to the minimum for in-work support (16 hours (lhw) since before 2009).

- *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 earnings⁵ (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 below for the different rates across the policy years.

Table 2.6 Amount of contributory Jobseeker's Allowance by age for 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per week	Jun-10 2010/11 £ per week	Jun-11 2011/12 £ per week	Jun-12 2012/13 £ per hour	Jun-13 2013/14 £ per week
18-24 years old	50.95	51.85	53.45	56.25	56.80
25 or over	64.30	66.45	67.50	71.00	71.70
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, 2009/10 to 2013/14

⁵ 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.

- *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. 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 while contributory JSA requires the individual to have worked in the last two years. Therefore, the eligibility for contributory JSA is overestimated, if simulated. An option (the last function in the policy) allows the maximum duration of the contributory JSA to be simulated as lasting six months, the maximum entitlement.

2.5.3 Working Tax Credit and Child Tax Credit

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 2009-2013. It was £25,000 in 2009 and was reduced to £10,000 in 2011/12 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 4.1.3 for more information.

- *Eligibility conditions*

Working Tax Credit ($bwkmt_s$) is an income-based credit for working adults who are either ($sin02_s = 1$)

- 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 ($sin06_s$). 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:

- 1) The 'relevant period'
- 2) The 'maximum amount'
- 3) The 'relevant income'
- 4) Comparing the 'relevant income' to the 'threshold figure'
- 5) 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 (sin04_s).

The maximum of the Child Tax Credit is the sum of the family element (£545 per year (in 2009/10), doubled if one child is aged below 1 years old (sin07_s)) and the child element of £2,235 yearly (in 2009/10), paid for each child in the family. Children with disability are entitled to additional payments (sin08_s).

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 tables below.

Table 2.7 Working Tax Credit amounts from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per year	Jun-10 2010/11 £ per year	Jun-11 2011/12 £ per year	Jun-12 2012/13 £ per year	Jun-13 2013/14 £ per year
WTC Basic element	1,890	1,920	1,920	1,920	1,920
WTC Lone parent element	1,860	1,890	1,950	1,950	1,970
WTC Couple element	1,860	1,890	1,950	1,950	1,970
WTC 30 hours element	775	790	790	790	790
WTC Disability element	2,530	2,570	2,650	2,790	2,855
WTC Severe disability element	1,075	1,095	1,130	1,190	1,220
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	80%	80%	70%	70%	70%

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

The childcare element (sin03_s) 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 80% from 2009, but 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.

Table 2.8 Child tax credit amounts from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per year	Jun-10 2010/11 £ per year	Jun-11 2011/12 £ per year	Jun-12 2012/13 £ per year	Jun-13 2013/14 £ per year
CTC Family element	545	545	545	545	545
CTC extra for child under 12 months	545	545	545	545	545
CTC Child element	2,235	2,300	2,555	2,690	2,720
CTC disability child additional Element	2,670	2,715	2,800	2,950	3,015
CTC Severe disability disabled child additional element	1,075	1,095	1,130	1,190	1,220

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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.

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 2009 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 £16,040 per year in 2009. See the tables for subsequent years’ figures.

Table 2.9 Child tax credit thresholds from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per year	Jun-10 2010/11 £ per year	Jun-11 2011/12 £ per year	Jun-12 2012/13 £ per year	Jun-13 2013/14 £ per year
First threshold	6,420	6,420	6,420	6,420	6,420
First threshold if not entitled to Working Tax Credit	16,040	16,190	15,860	15,860	15,910
First withdrawal rate	39%	39%	41%	41%	41%
Second threshold	50,000	50,000	40,000	--	--
Second withdrawal rate	6.67%	6.67%	41%	--	--

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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 39% in 2009). 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 2009 the family element of CTC was only tapered away if the ‘relevant income’ was in excess of the second threshold, i.e. £50,000 (reduced to £40,000 in 2011). Only if that is the case it was tapered away at 6.67%. From 2011 the child element is tapered away at a higher rate: 41%. 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.

- *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)

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*

None, as child benefit is a universal benefit paid for all dependent children.

- *Benefit amount*

Child Benefit consists of £20.00 per week for the first or only child in 2009/10. For each additional child £13.20 is paid per week (see the table below for the rates in the other policy years). Essentially therefore the weekly entitlement is $CB = £20.00 + (13.20 * (\text{number of children} - 1))$.

Table 2.10 Child benefit rates from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
	£ per week	£ per week	£ per week	£ per year	£ per year
Only/Eldest child	20.00	20.30	20.30	20.30	20.30
Other child(ren)	13.20	13.40	13.40	13.40	13.40

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

- *Interaction with other benefits*

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 2.5.10).

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 taxable child benefit awarded.

2.5.5 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 receive contributory JSA at the same time.

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 2009/10 this only refers to lone parents whose youngest child is 12), or people on unpaid parental leave. Additional conditions are that claimants are not full-time students, are under 60 (or the current female state pension age), 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:

- Working less than 16 hours per week
- 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:

$$\text{IS/ib-JSA Applicable amount} = \text{personal allowances} + \text{premiums} + \text{housing costs}$$

The personal allowances (sin05_s) for both benefits are outlined in the table below.

Table 2.11 Income Support and income-based Jobseeker’s Allowance rates from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per week	Jun-10 2010/11 £ per week	Jun-11 2011/12 £ per week	Jun-12 2012/13 £ per week	Jun-13 2013/14 £ per week
Single or lone parent 16-17	50.95	51.85	53.45	56.25	56.80
Single 18-24	50.95	51.85	53.45	56.25	56.80
Single 25 or over	64.30	65.45	67.50	71.00	71.70
Lone parent 18 or over	64.30	65.45	67.50	71.00	71.70
Couple one under 18	76.90	78.30	80.75	84.95	85.80
Couple both over 18	100.95	102.75	105.95	111.45	112.55

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

Premia

Premia are amounts that are added to the personal allowance, if the relevant conditions are satisfied (sin01 to sin04_s and sin06_s). Rates of premia are the same for all claimants, irrespective of their age. Relevant premium conditions and weekly rates are listed in the table below. A benefit unit can receive several premia.

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 (sin01_s) 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) 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 (sin02_s) 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 (sin04_s) are that the Disability Living Allowance Care Component is received at the highest rate (bdisc>£70.35 per week in 2009).

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

The carer premium (sin03_s) 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.

Table 2.12 Income Support and income-based Jobseeker’s Allowance premia from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
	£ per week	£ per week	£ per week	£ per week	£ per week
Carer premium - one qualifies	29.5	30.05	31.00	32.60	33.30
Carer premium - both qualify	55.5	60.10	62.00	65.20	66.60
Disability premium - single	27.5	28.00	28.85	30.35	31.00
Disability premium - couple	41.1	39.85	41.10	43.25	44.20
Enhanced disability premium - single	13.4	13.65	14.05	14.80	15.15
Enhanced disability premium - couple	19.3	19.65	20.25	21.30	21.75
Severe Disability – one qualifies	52.85	53.65	55.30	58.20	59.50
Severe Disability- two qualify	105.70	107.30	110.60	116.40	119.00

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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 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.

Table 2.13 Income Support and income-based Jobseeker’s Allowance earnings disregards and capital limits from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
	£ per week	£ per week	£ per week	£ per week	£ 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, 2009/10 to 2013/14

[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. Providing that the claimant is responsible for the housing costs (sin24_s), mortgage interest payments (xhcmomi) may be included in the calculation of the applicable amount. 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 these 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 (sin25_s). The “householder” in the UK is the person responsible for the rent or mortgage interest (sin24_s). They are identified in the UK data. 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) (sin25_s). 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. The table below sets out the rates for the different income brackets.

Table 2.14 Non-dependent deductions on Income Support and income-based Jobseeker’s Allowance from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per week	Jun-10 2010/11 £ per week	Jun-11 2011/12 £ per week	Jun-12 2012/13 £ per week	Jun-13 2013/14 £ per week
Deduction applying if income is above	47.75 382	47.75 382	60.6 387	73.85 394	87.75 394
Deduction applying if income is above	43.5 306	43.5 306	55.2 310	67.25 316	79.95 316
Deduction applying if income is above	38.2 231	38.2 231	48.45 234	59.05 238	70.02 238
Deduction applying if income is above	23.35 178	23.35 178	29.6 180	36.1 183	42.90 183
Deduction applying if income is above	17.00 120	17.00 120	21.55 122	26.25 124	31.25 124
Deduction otherwise ^[a]	7.4	7.4	9.4	11.45	13.60

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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 2.3 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.

2.5.6 Pension Credit (boamt_s)

This is an income maintenance benefit paid to those aged 60 years or older (the age threshold moves with the female state pension age; it is 61 in 2013). 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.

2.5.6.1 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 (sin16_s) and have benefit unit income (il_GC_means) below the ‘standard minimum income guarantee’ This level is set out in the table below.

Table 2.15 Pension Credit Minimum Guarantee 2009-2013

As of...	Jun-09	Jun-10	Jun-11	Jun-12	Jun-12
Fiscal year:	2009/10	2010/11	2011/12	2012/13	2012/13
	£ per week	£ per week	£ per week	£ per week	£ per week
Single person	130.00	132.60	137.35	142.70	142.70
Couple	198.45	202.40	209.70	217.90	217.90

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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 £6,000 (£10,000 from 2010), £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 the table above (i.e. they are equivalent to the level of the guarantee) and the premia are set out in the table below.

Table 2.16 Pension Credit (GC) premia and capital limits 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per week	Jun-10 2010/11 £ per week	Jun-11 2011/12 £ per week	Jun-12 2012/13 £ per week	Jun-12 2012/13 £ per week
Severe Disability Premium- single or one qualifies	52.85	53.65	55.3	58.20	59.50
Severe Disability Premium- couple (both qualify)	105.70	107.3	110.6	116.40	119.00
Carer Premium- single or one partner qualifies	29.50	30.05	31.00	32.60	33.30
Carer Premium- couple (both qualify)	59.00	60.1	62.00	65.20	66.60
Capital lower limit	6,000	10,000	10,000	10,000	10,000

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

- **Benefit amount**

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

2.5.6.2 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 the table below.

- **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 the table below). This amount is compared with the maximum savings credit which was £20.40 per week for a single person and £27.03 for a couple in 2009.

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 2.17 Savings Credit thresholds, maxima and withdrawal rate 2009 to 2013

As of...	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13
Fiscal year:	2009/10	2010/11	2011/12	2012/13	2013/14
	£ per week	£ per week	£ per week	£ per week	£ per week
Threshold single	96.0	98.4	103.15	111.80	115.80
Threshold couple	153.4	157.25	164.55	178.35	183.90
Maximum single	20.40	20.52	20.52	18.54	18.06
Maximum couple	27.03	27.09	27.09	23.73	22.89
Withdrawal rate	40%	40%	40%	40%	40%

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

Note that the maximum Savings Credit is being reduced from 2013 onwards.

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.

2.5.7 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) 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:

- having limited capability for work because of mental or physical conditions, which is determined as part of a work capability assessment;
- having benefit unit income lower than the applicable amount;
- having capital less than £16,000.
- 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 ;
- 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.

The applicable amount is calculated by adding together

- the personal allowances (which are the same as IS and ib-JSA),
- premia (only the enhanced disability, severe disability, carer and pensioner premia may apply); and
- in the main phase, either the support component⁶ or the work-related activity component⁷; and

⁶ 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”.

⁷ 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.

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

Table 2.18 Income-based Employment and Support Allowance additional premia from 2008 to 2012

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
	£ per week	£ per week	£ per week	£ per week	£ per week
Work-related activity component	25.5	25.95	26.75	28.15	28.45
Support component	30.85	31.4	32.35	34.05	34.80

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

- ***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 is being introduced gradually from October 2008 and will be fully in place by 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 is 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 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 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. 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 count 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.

2.5.8 Housing Benefit (including Local Housing Allowance) (bho_s)

Housing benefit (HB) and Local Housing Allowance (LHA) cover or 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 in April 2008 by the LHA is a limitation to the contribution toward the cost of rent for private sector tenants. This is achieved by:

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

The policy is being rolled-out from 2008 to 2013.

- *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’ (sin09_s)

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 (sin07_s) and premia are mainly the same as for IS/ib_JSA for claimants under 60. Exceptions, and the rates and premia for those aged 60 and 65+ are shown in the table below.

Table 2.19 Housing Benefit Allowances and premia (where different from those for IS) from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per week	Jun-10 2010/11 £ per week	Jun-11 2011/12 £ per week	Jun-12 2012/13 £ per week	Jun-13 2013/14 £ per week
Family premium	17.3	17.4	17.4	17.4	17.4
Family premium (baby under 1 addition)	10.5	10.5	0	0	0
Disability premium – child	51.24	52.08	53.62	56.63	57.89
Enhanced disability premium - child	20.65	21.0	21.63	22.89	23.45
Single pensioner between 60 and 64	130.0	132.6	137.35	142.70	145.40
Single pensioner 65 or over	150.4	153.15	157.9	161.25	163.50
Pensioner couple both between 60 and 64	198.45	202.4	209.7	217.90	222.05
Pensioner couple one or both 65 or over	225.5	229.5	236.8	241.65	244.95
Dependent children under 20	56.11	57.57	62.33	64.99	65.62

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

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* 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

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

Table 2.20 Local Housing Allowance national rent limits from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per week	Jun-10 2010/11 £ per week	Jun-11 2011/12 £ per week	Jun-12 2012/13 £ per week	Jun-13 2013/14 £ per week
One-bedroom shared accommodation	--	--	125.00	250.00	250.00
One-bedroom self-contained accommodation	--	--	250.00	250.00	250.00
Two-bedroom accommodation	--	--	290.00	290.00	290.00
Three-bedroom accommodation	--	--	340.00	340.00	340.00
Four + bedroom accommodation	--	--	400.00	400.00	400.00

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2013/14

From 2012, for all claimants,

- a) the £15 per week addition was removed;
- b) 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: BRMAs are not possible to identify in the EUROMOD input data. 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 for (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:

- the claimant or partner receive the 30 hour element in WTC,
- the claimant or partner are aged 25 or over and work 30+ hours,
- the claimant or partner work 16 hours or more and the claim includes the family premium,
- 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 (sin11_s) are topped up by £16.85 in 2009 and £17.10 in 2010-13.

The earnings disregard for lone parents for the purposes of HB/LHA is £25.⁸

⁸ 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 simulation.

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 (sin13_s) 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 £6000 (£10,000 from 2010).

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.

2.5.9 Council Tax Benefit (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, e.g. 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 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 2013, with parameters updated in line with those for IS and HB.

- **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 the table below).

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.

Table 2.21 Non-dependent deductions for Council Tax benefit from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
	£ per week	£ per week	£ per week	£ per week	£ per week
Deduction applying if income is above	6.95 382	6.95 382	8.6 387	9.9 394	9.9 394
Deduction applying if income is above	5.8 306	5.8 306	7.2 310	8.25 316	8.25 316
Deduction applying if income is above	4.6 178	4.6 178	5.7 180	6.55 183	6.55 183
Deduction otherwise	2.3	2.3	2.85	3.3	3.3

Source: CPAG Welfare Benefits and Tax Credits Handbooks, 2009/10 to 2012/13. Parameters for 2013/14 are assumed, based on those for Income Support and Housing benefit (see text).

2.5.10 Benefit Cap (brd_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 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. (Note that in the explanation below reference to UC is not relevant until after the EUROMOD 2013 policy year.)

- *Cap liability*

The benefit cap only applies if the benefit unit either receives HB for people below the qualifying age for PC (or UC), and 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:

- Benefit unit receiving Working Tax Credit
- Benefit unit not receiving IS, ib-JSA or ib-ESA,
- 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,
- 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.⁹

- *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.¹⁰

- *Amount*

The amount of the cap is calculated slightly differently depending on whether it applies through HB or UC.

⁹ Exceptions for which the benefit cap does not apply when applied through UC:

- Benefit units with net monthly earnings of at least £430 in their monthly UC assessment period
- People within a “grace period” of 9 months since stopping work
- People entitled to any of the following disability benefits: the ESA support component, UC that includes the limited capability for work-related activity component, people receiving attendance allowance, disability living allowance (or PIP), industrial injuries disablement benefit, reduced earnings allowance or retirement allowance, war pension.

¹⁰ If the cap is applied through UC: the specified benefits to be capped are: UC, JSA, ESA (if neither the claimant or his/her partner are in the support group), bereavement allowance, carer’s allowance, child benefit, guardian’s allowance, maternity allowance, widowed allowances and widow’s pension.

If the cap is applied through HB, the cap applies when weekly entitlement to certain specified benefits exceeds a threshold of £500 a week for couples and lone parents or £350 a week for singles.¹¹

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.

2.6 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_empNearn`s).

- *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 (`sin02_s`).

- *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. The table below shows the thresholds (gross earnings limits) and rates.¹²

¹¹ If the cap is applied through UC, it the benefit payments are converted into monthly amounts. The cap applies when monthly entitlement to certain specified benefits exceeds a threshold of £2,167 a month for couples or lone parents, and £1,517 a month otherwise.

¹² Women who are married or divorced and opted out before 1977 pay a lower rate of 4.85% (in 2009) applying to earnings between PT and UEL. However, since this can only apply to married/divorced women aged 48 or more in 2009, 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.

Table 2.22 Gross earnings limits and rates for Class 1 (employee) National Insurance contributions 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
	£ per week	£ per week	£ per week	£ per week	£ per week
Gross earnings limits:					
Primary Threshold (PT)	110	110	139	146	149
Upper Earnings Limit (UEL)	844	844	817	817	797
Rates:					
Between PT and UEL:					
<i>Non contracted out</i>	11%	11%	12%	12%	12%
<i>Contracted out</i>	9.4%	9.4%	10.4%	10.6%	10.6%
Above UEL	1%	1%	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 in 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 the table below for the amounts and level of the exception.

Table 2.23 Rates for self-employment Class 2 National Insurance contributions from 2009-2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
Flat rate (£ per week)	2.40	2.4	2.5	2.65	2.70
Small Earnings Exception (£ per year)	5,075	5,075	5,315	5,595	5,725

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) (sin04_s) with a lower rate applying on income above the upper limit (sin05_s)..

Table 2.24 Upper and Lower Profit Limits for self-employment Class 4 National Insurance contributions from 2009-2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
Lower Profits Limit(LPL) (£ per year)	5,715	5,715	7,225	7,605	7,755
Upper Profits Limit(UPL) (£ per year)	43,875	43,875	42,475	42,475	41,450
Rate between LPL and UPL	8%	8%	9%	9%	9%
Rate above UPL	1%	1%	2%	2%	2%

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

2.6.2.1 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:

- 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 (sin06_s)
- Then, from that combined figure any Class 1 and Class 2 NICs that have been paid are deducted (sin07_s)
- This gives the maximum amount of Class 4 NICs that the contributor is liable to pay at the main rate (sin08_s)
- 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

- If that figure is positive it represents the amount of profits on which Class 4 NICs at 1% (in 2009) are payable (sin09_s).

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

- those who are due to pay (in 2009):
 - Class 4 NICs at a rate of 8 % only (sin12_s)
- those who are due to pay:
 - a mixture of Class 4 NICs at rate of 8% and 1% (sin11_s) and
- those who are due to pay:
 - Class 4 NICs at a rate of 1% only (above the UEL = sin13_s and below the UEL = sin14_s)”

Source: HMRC (2010) National Insurance manual, <http://www.hmrc.gov.uk/manuals/nimmanual/NIM24170.htm>, last accessed 19.07.2010.

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). There is no upper ceiling on contributions from employers.

Table 2.25 Thresholds and rates of employers’ social insurance contributions from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
Secondary Threshold (ST) £/week	110	110	136	144	148
Non contracted out rate above ST	12.8%	12.8%	13.8%	13.8%	13.8%
Contracted out rate between ST and UEL	9.1%	9.1%	10.1%	10.4%	10.4%
Contracted out rate above UEL	12.8%	12.8%	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. In 2013 an exception has been introduced concerning 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).

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, training allowance.

2.7.3 Tax allowances (tinta_s)

There is a basic tax free **Personal Allowance** (sin01_s).¹³ There are additional “**Age allowances**” for older individuals which are income-tested. Thus, if an older taxpayer has annual taxable income over a threshold (£22,990 in 2009) the additional age-related allowance is reduced using a 50% taper until the level of the standard Personal Allowance is reached (sin02_s). 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.

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 couples 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.)

¹³ There is an allowance for blind people. However, this is not simulated here due to lack of information in the input data.

Table 2.26 Tax allowances from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per year	Jun-10 2010/11 £ per year	Jun-11 2011/12 £ per year	Jun-12 2012/13 £ per year	Jun-13 2013/14 £ per year
Personal Allowance					
under X years old	6,475	6,475	7,475	8,105	9,440
X-Y years old	9,490	9,490	9,940	10,500	10,500
Y years old or over	9,640	9,640	10,090	10,660	10,660
X	65	65	65	65	66
Y	75	75	75	75	76
Income limit for age-related allowances	22,900	22,900	24,000	25,400	26,100
Income limit for personal allowances	n/a	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 the 2009-10 tax year all in this category will become 75 at some point and will therefore be entitled to the age 75 and over allowance. HMRC 2010, <http://www.hmrc.gov.uk/rates/it.htm>, last accessed 19.07.11.

2.7.4 Tax base

Taxable income (ils_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 benefit¹⁴ (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.

¹⁴ 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.

2.7.5 Tax schedule

The main tax thresholds and rates are set out in the table below.

Table 2.27 Income tax thresholds and rates from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10	Jun-10 2010/11	Jun-11 2011/12	Jun-12 2012/13	Jun-13 2013/14
	£ per year	£ per year	£ per year	£ per year	£ per year
Savings rate threshold	2,440	2,440	2,560	2,710	2,790
Basic rate threshold	37,400	37,400	35,000	34,370	32,010
Higher rate threshold	n/a	150,000	150,000	150,000	150,000
Savings rate %	10	10	10	10	10
Basic rate %	20	20	20	20	20
Higher rate %	40	40	40	40	40
Additional rate %	n/a	50	50	50	45

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). This happens in practice only if, without the investment income, taxable income is less than the savings rate threshold (e.g. £2,440 in 2009). In that case, the tax system treats the savings income as the “top slice” and applies the lower rate of 10% to any excess of the threshold over non-savings taxable income (or to the savings income itself, if this is lower).

2.7.6 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 74 years old or over in 2009) (sin05_s). The MCA can be claimed by the husband if the couple married before 2005 (otherwise by partner with highest income);¹⁵ any unused allowance can then be transferred to the spouse or civil partner (sin09_s). 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 (sin08_s). MCA levels for the relevant policy years are listed in the table below.

¹⁵ EUROMOD assumes that the MCA is claimed by the husband in all cases.

Table 2.28 Tax credits from 2009 to 2013

As of... Fiscal year:	Jun-09 2009/10 £ per year	Jun-10 2010/11 £ per year	Jun-11 2011/12 £ per year	Jun-12 2012/13 £ per year	Jun-13 2013/14 £ per year
MCA	6,965	6,965	7,295	7,705	7,915
Lower age limit for MCA	75	75	75	75	76
Minimum MCA	2,670	2,670	2,800	2,960	3,040
Income limit for age-related allowances	22,900	22,900	24,000	25,400	26,100
Tax relief rate for the MCA	10%	10%	10%	10%	10%

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

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 age of 65 and had personal care and/or mobility needs. DLA for people age 16 to 64 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.

3. DATA

3.1 General description

The UK database is drawn from the Family Resources Survey (FRS) 2009/10.¹⁶ 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 requirement 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 2009/10 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

¹⁶ See http://research.dwp.gov.uk/asd/frs/2009_10/frs_2009_10_report.pdf. From 2013 the EU-SILC for the UK will be based on the FRS.

of residential care, prisoners and people living in military or police institutions.¹⁷ 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.¹⁸ 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 and investment income and is limited to 0.5% of all responses. The EUROMOD database makes use of the imputed data.

Table 3.1 EUROMOD database description

EUROMOD database	UK_2009_a2
Original name	Family Resources Survey
Provider	Department for Work and Pensions
Year of collection	2009/10
Period of collection	April 2009 – March 2010
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	57,380 individuals
Response rate	58%

¹⁷ 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.

¹⁸ <http://www.statistics.gov.uk/about/data/harmonisation/default.asp>

3.2 Sample quality and weights

3.2.1 Non-response

In 2009/10, 58% of the 48,315 sampled households provided full cooperation¹⁹ with regional variation in response rates reflecting patterns found in other major surveys (see Table 38 below). In 2009/10, for those households classed as fully co-operating, proxy responses were obtained for 17 per cent of adults.

Table 3.2 Household response rates in the FRS 2009/10 by government office regions

Government Office Region	Response rate of all households
North East	62
North West	59
Yorkshire and the Humber	62
East Midlands	61
West Midlands	60
East of England	60
London	49
South East	54
South West	52
England	57
Wales	61
Scotland	63
Northern Ireland	65
United Kingdom	58

Source: DWP, Family Resources Survey 2009/10
http://campaigns.dwp.gov.uk/asd/frs/2009_10/chapter7.pdf

Lower response rates than the average were seen in households in London (as shown in Table 3.2), 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 reference person was self-employed or unemployed.

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 2009/10 are based on population totals by gender and age groups in each Government Office Region (ONS and General Register Office for Scotland); number of

¹⁹ Individual full cooperation requires less than 13 “don’t know” or “refusal” answers to monetary amount questions out of approx 50 questions.
 (http://campaigns.dwp.gov.uk/asd/frs/2009_10/chapter7.pdf)

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 (ODPM²⁰, 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 (NISRA²¹), number of lone parents and households (Northern Ireland Department for Social Development estimates).²²

Table 3.3 Descriptive Statistics of the Grossing-up weight

	UK_2009_b2
Number	57,380
Mean	1056.107
SD	486.2411
Maximum	5935
Minimum	209
Max/Min	28.40

No households have been dropped from the sample. The original sample size includes 57,380 individuals and 25,200 households. Applying weights included in the dataset to gross the numbers up to population figures gives 60,599,396 individuals and 26,379,932 households.

3.3 Imputations and assumptions

The FRS data are obtained from the UK Data Archive at the University of Essex.²³ Adjustments to variables are kept to a minimum.

It should be noted that in the 2009/10 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.

²⁰ Then, the Office of the Deputy Prime Minister.

²¹ Northern Ireland Statistics and Research Agency.

²² For more detail about the extent of imputation and control totals variables used to generate grossing factors, see DWP, Family Resources Survey 2008/09 http://campaigns.dwp.gov.uk/asd/frs/2009_10/chapter7.

²³ 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 week²⁴ 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).

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 or DLA. For this second case we create a binary variable lcr01, 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 (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 and Disability Living Allowance); 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.).

²⁴ 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 by 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 previous section 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 to a Local Authority District (LAD)-BRMA table²⁵ 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 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.

In our base data (FRS 2009/10) we observe women entitled to SPA from age 60, while in 2010 onward women will be entitled to State Pension only from age 60 and one month²⁶, in 2011 from age 60 and 7 months, in 2012 from age 61 and one month, in 2013 from age 61 and seven months and in 2014 from age 62 and one month and so on. Therefore women age 60 observed

²⁵ We would like to thank 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.

²⁶ See Pension Act 2007 and 2011 for more details.

as receiving the State Pension in our base data will not be entitled to it in our simulated year 2012 and only some of those aged 61 will be entitled to it. These women could either be working, inactive or receiving/entitled to some kind of income replacement benefit.

We allow for some mechanical and some simple behavioral response to the increases in the female SPA for these affected women. First, we 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*). 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 58-59 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 60 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 51-65 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 60 and over (up to the new SPA) in our base data in a world where the SPA has increased over 60 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 60 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* = 09, 10, 11, 12, ... 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 (*lhviv01* or *lhviv02*) and a compulsory private pension contribution (*tpceevpx*).²⁷

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.
- Other members of the household not directly affected by the SPA increase do not change their labour market behaviour (ie, 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

²⁷ 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.

allowance (ESA) instead. By 2014 all those unable to work through disability or ill health should be transferred from IB to ESA. In simulating the population between 2009-10 and 2012-13, we need to take into account the steady fall in the number receiving IB, and the steady rise in the number receiving ESA.

We do this in a number of steps.

First, we reflect the turnover in the population on disability benefits between 2009-10 (the period of our data) to 2010-11. The DWP tabulation tool (accessed July 2012) tells us that the number of individuals claiming long-term IB fell by 124,000 between 2009 and 2010, whilst ESA claims increased by 72,000. We replicate this 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.

Second, we take account of the fact that, between April 2011 and March 2014, existing claimants of IB (including women age 60-61 “moved” to IB because of the SPA rise (see above)) will be reassessed to determine whether they are entitled to ESA and, if so, which level of the benefit they are entitled to. We assume that the rate of reassessment is constant (i.e. 25% of those on IB in 2010 are reassessed for ESA in each year between 2011 and 2014).

Of those reassessed, we assume that 29% move into the Support Group, 34% to the Work Related Activities Group (WRAG) and 37% are found to be fit for work and lose entitlement to disability benefits (figures taken from http://research.dwp.gov.uk/asd/asd1/stats_summary/stats_summary_may12.pdf).

The final IB/c-ESA benefit values for each year are recorded in specific variables. The IB amount is saved in *bdict0109-bdict0113* for each simulated year between 2009 and 2013. The c-ESA amount is reported by *bdict0209-bdict0214* for each year between 2009 and 2014. From 2014 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 *Uprate_uk*.

Third, 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. Table 3.4 below shows the end product by 2014/15 (when the whole transition processed should be completed) of all these adjustments.

Table 3.4 Estimated number of ESA recipients in 2014-5

	number of cases	Grossed-up number of cases
Total individual observed with a disability	1,358	1,289,035
ESA claims		
Support Group (SG)	695	664,792
Working Related Activities Group (WRAG)	176	166,689
Total ESA successful claims (SG+WRAG)	871	831,481

Source: Authors’ calculation. A further 487 cases (457,554 grossed-up) who in the original FRS are receiving IB are simulated to be Fit for Work under ESA in 2014.

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 <http://www.esds.ac.uk/findingData/snDescription.asp?sn=6523>

3.3.2 Gross incomes

Gross incomes are imputed using the simple formula:

$$\text{Gross income} = \text{net income} + \text{tax} + \text{employee social insurance contributions} + \text{other deductions}$$

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).²⁸ 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

²⁸ Where ranges of take-up proportions are published, the mid point is used.

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 below, some of this effect is captured.

Table 3.5 Take-up probabilities

Benefit and tax credit claimant type	Probability of take-up
Housing benefit for pensioners (>60/65) if not receiving PC(GC)	0.825
Housing benefit for people of working age in work if not receiving IS	0.45
Housing benefit for people of working age without work if not receiving IS	0.95
Council tax benefit for owners (with and without mortgage) if not receiving IS or PC	0.385
Council tax benefit for tenants if not receiving IS or PC(GC)	
Council tax benefit for private tenants	0.83
Council tax benefit for social tenants	0.905
Pension credit (guarantee or guarantee+savings)	0.765
Pension credit (savings only)	0.455
Income support for people without children	0.795
Income support for people with children	0.875
Child tax credit* and working tax credit for lone parents (not London)	0.94
Child tax credit* and working tax credit for couples with children (not London)	0.74
Child tax credit* and working tax credit (all parents) in London	0.69
Child tax credit family element only	0.68
Working tax credit (no children)	0.27

Source: DWP 2010 and HMRC 2010

* If parents are taking up IS, CTC is assumed to be taken up.

The correction is switched on by default in the baseline. To switch the take-up corrections off throughout the UK module, a user needs to use the relevant switch (BTA) in the run window of EUROMOD). Take-up probabilities summarised in Table 3.5 are defined as constants (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

The factors that are used to update monetary variables (parameter sheet *Uprate_uk*) from the mid-point of the data year (October 2009) to the mid-point of the policy years applying on June 30th (i.e. October 2010 to October 2013) are shown in Annex 1. No other updating adjustments are employed. Thus the distribution 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 2009/10.

4. VALIDATION

4.1 Aggregate Validation

EUROMOD results are validated against external benchmarks. Detailed comparisons of the number of people receiving a given income component and total yearly amounts are shown in Annex 2. Both market incomes and non-simulated taxes and benefits in the input dataset as well as simulated taxes and benefits are validated against external official data. The main discrepancies between EUROMOD results and external benchmarks are discussed in the following subsections. Factors that may explain the observed differences are also discussed.

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) 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 (INDISBEN²⁹), total income from other benefits (INOTHBEN³⁰), remaining income (INRINC³¹) and total amount of tax credits received (INTXCRED³²).

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 two disposable income concepts are not identical. The differences between EUROMOD and the FRS are outlined in the following table.

²⁹ 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.

³⁰ 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.

³¹ 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 allowance's from Local Authorities/SS for foster and adopted children.

³² Total amount of tax credits sums Working Tax Credit and Child Tax Credit.

Table 4.1 Components of disposable income

	EUROMOD 2009	FRS 2009/10
	ils_dispy	NINDINC
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	+	+
<i>Unemployment benefits</i>	+	+
<i>Old-age benefits</i>	+	+
<i>Survivor' benefits</i>	+	+
Sickness benefits	+	+
Disability benefits	+	+
Education-related allowances	+	+
Income from rental of a property or land	+	+
<i>Family/children related allowances</i>	+	+
Social exclusion not elsewhere classified	+	+
Housing allowances	+	+
Regular inter-household cash transfer received	+	+
Interests, dividends, etc.	+	+
Income received by people aged under 16	+	+
Regular taxes on wealth	-	-
<i>Regular inter-household cash transfer paid</i>	-	-
<i>Tax on income and social contributions</i>	-	-
<i>Repayments/receipts for tax adjustment</i>	0	0

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 4.2 compares aggregate earnings in EUROMOD with estimates from the Annual Survey of Hours and Earnings (ASHE) in 2009. 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 4.2 shows that average earnings across all employees in the EUROMOD 2009/10 FRS database is close (97%) to the corresponding average value from ASHE 2009, across all employees whose pay is not affected by absence. The male earnings are covered less well (96%) than female earnings (99%).

Also shown are the EUROMOD averages for 2010 to 2013 compared with ASHE for the corresponding years. The match is similar for the non-updated FRS data, with the EUROMOD

estimate moving closer to that of ASHE in 2012 (99%) and then exceeding it slightly in 2013, driven by female earnings (overestimated in EUROMOD by 1.3%).

Figure 4.1 compares the cumulative earnings distribution from ASHE and the EUROMOD input data for 2009 for all employees and for men and women (plotting decile points cumulatively). The distributions are close, although the distribution diverges around the bottom and middle of the distribution for men (earnings are somewhat higher in the ASHE data).

Figure 4.1. Cumulative earnings distributions in 2009: EUROMOD (FRS) and ASHE

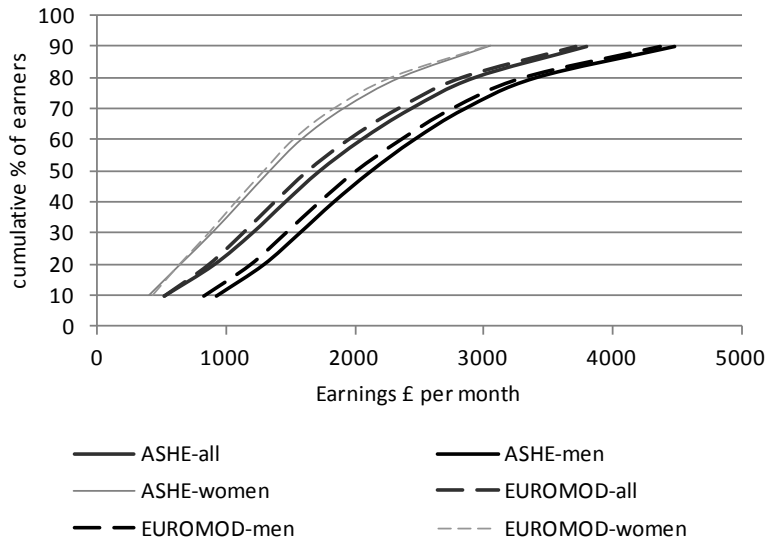


Table 4.2 Average gross monthly earnings from employment in 2009-2013, comparing ASHE and the EUROMOD (EM) input database

	2009			2010			2011			2012			2013		
	EM	ASHE	Ratio	EM	ASHE	Ratio	EM	ASHE	Ratio	EM	ASHE	Ratio	EM	ASHE	Ratio
All	2014.7	2083.9	0.967	2054.8	2112.9	0.972	2094.1	2110.3	0.992	2121.1	2124.6	0.998	2181.5	2176.2	1.002
Male	2444.9	2554.1	0.957	2493.5	2580.5	0.966	2541.2	2580.9	0.985	2575.2	2583.5	0.997	2648.5	2651.6	0.999
Female	1580.8	1604.2	0.985	1612.2	1635.0	0.986	1643.0	1625.9	1.011	1664.7	1654.0	1.006	1712.1	1690.9	1.013

Sources: Source: Annual Survey of Hours and Earnings 2013, 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.

- *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 be associated with, the non-simulated components.

Table 4.4 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, Employment and Support Allowance and the State Pension 2009-13, 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. See Section 3.3 “Increase of female pension age” and “Transition from Incapacity Benefit to Employment and Support Allowance” above.

The numbers on Incapacity Benefit and contributory Employment and Support Allowance combined are under-estimated by EUROMOD/FRS in 2009 and 2010 by 6%, the shortfall slightly increases in 2011, whilst in 2012 the simulated estimate, which accounts for increasing restrictions on entitlements related to the transition from IB to ESA (see section 3.3), matches very well the official forecasts. In 2013 EUROMOD under-estimates the fall in recipients of IB, and hence of the two benefits together.

Similarly while the numbers in receipt of basic state retirement pension are very well estimated in EUROMOD in 2009 (the external figures are adjusted to remove recipients living outside the UK) the actual numbers rise slowly over the period but our simulation of the effect of the rising state pension age for women reduces the EUROMOD estimate from 2012 (see section 3.3). It is likely that the general trends of more 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 16% in 2009 rising to 24% in 2013. The two sources of state pension are not distinguished in the data, our imputations may contribute to this 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 falling over the period and are over-estimated by 19% in EUROMOD in 2013 but underestimated in 2009 by 7%.

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 number in receipt of Carer’s Allowance has grown over the period and in 2009 it is underestimated in EUROMOD/FRS by 21% and in 2013 by 36%.

The number of Jobseeker’s Allowance (contributory) recipients halved between 2009 and 2013. The estimates from EUROMOD/FRS are generally too low at the beginning of the period but too high by 2013. However, the numbers are relatively small.

Severe Disability Allowance (SDA) is 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. Many claimants of one of these receive both and may not report the actual situation accurately when asked in the survey. Both Disability Living Allowance (DLA) and Attendance allowance (AA) are also under-reported, in the former case by 20% but by much more (43%) in the latter. The EUROMOD estimate of the number of DLA recipients falls off in 2013 because we randomly cut entitlement to adjust for government cuts due to transfers to PIP.

Finally, on the basis of a 2007 comparison (later figures are not available) the number of Council Tax payers appears to be well-represented in the FRS. However, the external figure corresponds to the number of dwellings on which payments are potentially due and includes second homes and empty properties which are not captured by the FRS data, suggesting that EUROMOD slightly over-estimates the number of payers.

Table 4.5 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 bit higher than those for recipients due to the fact that imputation of benefit amount assumes that the claims is 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.

Gross Council tax revenue is well-estimated by EUROMOD/FRS in 2011 and 2012. External figures for the earlier years are net of Council tax benefit while EUROMOD figures are gross of this.

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 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 repeats the comparison for the means-tested instruments, applying non take-up probabilities as described in the previous section.

Table 4.7a shows the aggregate annual expenditure, or revenue from each instrument, compared with official sources, assuming full take-up. Table 4.7b makes the same comparison for means-tested benefits and tax credits, correcting for non-take-up. Finally, Table 4.3 (below) compares EUROMOD and external estimates of expenditure for 2009 for selected simulated benefits and tax credits with aggregates from the FRS data (using the same weights as in the EUROMOD estimates).

Table 4.3 Selected benefits that are simulated by EUROMOD: comparison of aggregates with external statistics and data from FRS (2009/10) assuming incomplete take-up in EUROMOD estimates. Expenditure/revenue (£million/year)

	FRS 2009	EUROMOD 2009	External 2009	Ratio FRS / External	Ratio EUROMOD / External
Child Benefit	11,142	11,571	11,824	0.94	0.98
Working Tax Credit (WTC)	4,379	4,061	7,675	0.57	0.53
Child Tax Credit (CTC)	13,711	15,279	19,696	0.70	0.78
<i>CTC and WTC</i>	<i>18,090</i>	<i>19,340</i>	<i>27,371</i>	<i>0.66</i>	<i>0.71</i>
<i>WTC only</i>	<i>1,210</i>	<i>534</i>	<i>1,134</i>	<i>1.07</i>	<i>0.47</i>
Income Support+JSAinc+ESA	9,078	13,856	12,656	0.72	1.09
Pension Credit(PC) total	4,384	5,814	8,129	0.54	0.72
Housing benefit	15,709	18,676	19,989	0.79	0.93

Source: See Table 4.7a.

- *Child benefit*

EUROMOD produces estimates very close to the administrative figures for the number of families in receipt. 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 2009/10), this is not surprising. However, the number of children for whom benefit is received is under-estimated by 5% and the expenditure on the benefit under-estimated by 2% in 2009. Nevertheless, as shown by Table 4.3 the FRS data on Child Benefit (weighted) under-estimate expenditure by more: 6%. Over the period, the under-estimation in EUROMOD rises slightly, as it does not capture the small increase in number of children in the population. In 2013 the drop in expenditure shown by the external figures reflects the claw back of this benefit from parents with high incomes. In EUROMOD this is treated as an increase in income tax.

- *Winter fuel allowance*

EUROMOD over-estimates recipients by 5% and captures expenditure quite precisely in 2009. 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 2013 the number of recipients is matched exactly and there is an under-estimation of expenditure by 5%.

- *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 2009 is over-estimated compared with administrative statistics. This applies particularly to Income Support (including income tested JSA and income tested ESA), Pension Credit, Child Tax Credit and Council Tax Benefit. Once the take-up correction described in section 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 Child Tax Credit, Income Support (including other working age income tested benefits) and Council Tax benefit are still too high relative to external statistics (by 22%, 15% and 14% respectively); for Pension Credit they are underestimated (by 14%) and are very well estimated for Housing Benefit; but Working Tax Credit recipients are under-estimated by 32%.

For Income Support (including other working age income tested benefits) and Council Tax Benefit, and to some extent Housing Benefit the expenditure is over-estimated by EUROMOD

before any take-up correction (Table 4.7a) but is too low for Working Tax Credit (by 19%) and Child Tax Credit (by 5%). The take up correction reduces expenditure such that it is closer but still somewhat over the administrative total for Council Tax Benefit (by 8%) but underestimated by 7% for Housing Benefit, 28% for Pension Credit and by 22% for Child Tax Credit and especially Working Tax Credit (47%) (Table 4.7b). 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. However, with the exception of the Working Tax Credit, Table 4.3 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*

After the take-up correction the numbers on Child Tax Credit are over-estimated relative to the administrative total by 22% (Table 4.6b) whereas the estimated expenditure is under-estimated by the same percentage (Table 4.7b). The over-estimation of numbers is to some extent explained by the administrative statistics not containing some long-term recipients of Income Support, whose child payments have still not been migrated to the tax credit system. The reasons for the under-estimation of expenditure include the fact that those taking up are likely to have higher entitlements than those not taking up. While our take-up adjustment allows for some of this effect (the average payment assuming full take up is a little lower than the average payment with partial take up) it does not capture it all.

Probably the main cause of the apparent under-estimation also applies to Working Tax Credit. The administrative statistics that we use 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, in 2009/10 there was a very large income disregard of £25,000 which meant that the final award would only require a repayment if the repayment exceeded this amount. So in any cases where incomes did change we expect EUROMOD to under-estimate the actual payment. According to the HMRC statistics on final awards in 2008/9, for example, of 4,765 in-work families receiving one or both tax credits 3,400 thousand had an income which increased over the year and up to £25,000 was disregarded. It is therefore not surprising that the EUROMOD expenditure estimate is only 78% of expenditure assessed in this way.

The disregard has been reduced to £10,000 in 2011/12 and £5,000 in 2012/13. It is still the case that what EUROMOD simulates does not take account of increases in income later in the tax year or reductions in payment due to over-payment the previous year.

However, as shown by Table 4.3 FRS reported income from Child Tax Credit is also low relative to the administrative total, and indeed lower than the EUROMOD estimate. 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 almost half the administrative figure) for the same reasons: 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. Unlike Child Tax Credit, Working Tax Credit recipients are also under-estimated by EUROMOD (by 32%)

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.

- ***Income Support***

Even after the take-up correction the number of recipients of Income Support (IS) is over-estimated by 3% (Table 4.6b). (The external figures include those on income-tested JSA which is simulated along with Income Support in EUROMOD.) The numbers on income-related ESA are greatly over-estimated in 2009 (by 3 times) but this reduces to an underestimate of 42% in 2013. This is a period of transition for those potentially qualifying for IS or ib-ESA 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 somewhat too high relative to the external total (by 10% in 2009 rising to 17% in 2013).

This is in spite of the fact the FRS report says that IS recipients are 28% under-reported in FRS, even after adjusting admin total for people in institutions. Thus EUROMOD simulations perform better in this respect.

- ***Pension Credit***

After accounting for non take-up, Pension Credit recipients as a whole are under-reported by 14% and expenditure by 28%. However the external administrative total includes payments to recipients living in institutions who are not captured by FRS/EUROMOD. Adjusting the external total for this (making use of an adjustment factor of 150,000 or 5.5% derived from table M.6 of the FRS report) brings the recipient totals closer and reduces the expenditure shortfall in EUROMOD. The remaining 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 average payment in the right direction).

However, within PC there are many too few recipients of both Savings Credit (SC) and Guarantee Credit (GC), and too many receiving one or the other alone. One clue as to why there may be too many receiving SC alone may lie in the under-reporting of Pension Credit in the FRS (see Table 4.3). If FRS respondents confuse Pension Credit with their basic state pension payments and just report both as the basic state pension then this will be over-estimated in the FRS, and EUROMOD will automatically calculate them to be not quite eligible for GC. But their apparent excess of pension income over the basic pension amount will entitle them to some SC. Cases with GC but no SC may be over-estimated if the incomes which give rise to SC entitlement are under-reported.

Since 2010 Pension Credit expenditure has fallen by about 14% 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 (by about 5%) but not to the same extent as external statistics. As a result, the shortfall in EUROMOD is less than the end of the period than the beginning (20% compared with 28%).

- ***Housing Benefit***

After the take-up correction Housing Benefit recipients are well-estimated by EUROMOD (under-estimated by 2%). This is a significant improvement on the under-estimation in the FRS

data (under-reported by 21%).³³ However, in later policy years there is some under-estimation (14% by 2013) possibly explained by our modelling of the restrictions on the LHA component of Housing Benefit having too large an effect, combined with not capturing increasing numbers of households becoming entitled due to the recession. Expenditure is under-estimated by 7% in 2009 rising to 15% in 2013. (which is a great improvement on the 21% under-estimation in the FRS data, shown in Table 50). The updating of rents to 2013 may not capture differential growth in rent satisfactorily, and as mentioned above, the modelling of LHA rent restrictions which were strengthened in this period, can only be approximate. 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.

- ***Council Tax Benefit***

Council Tax Benefit (CTB) recipients are over-estimated even after the take-up correction, by 14%. Expenditure is over-estimated by less (8%). The reasons for this are difficult to establish exactly, except that entitlement to CTB 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 CTB. In 2013 responsibility for Council Tax Benefit was devolved to Local Authorities and national statistics are no longer available.

- ***Benefit Cap***

External statistics on the Benefit Cap, which was introduced in 2013, are not yet available.

- ***Income tax***

Compared with tax statistics, the number of income tax payers estimated by EUROMOD is very similar: under-estimated by 3 percentage points (Table 4.6a). Revenue from income tax is under-estimated, however, by 15% (Table 4.7b).

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 reports on a case study for 2010, comparing EUROMOD estimates with administrative statistics from tax records in more detail.

Over the period 2009-12 income tax revenue grew by 4% according to external statistics and by 6% according to EURMOD.

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***

External figures on contributors are only available up to 2008. At that point there was a shortfall of 19%. The explanation for the underestimation of numbers of both employed and self-

³³ http://statistics.dwp.gov.uk/asd/frs/2009_10/frs_2009_10_report.pdf. See Table M.6.

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, revenue from employee contributions are relatively well captured (100% in 2009 falling to 95% in 2012) – see Table 4.7b. Information on the number of employees for whom employers make contributions is not available. There is a shortfall of revenue from employer contributions of 12-15% over the period.

EUROMOD estimates of revenue from contributions made by the self-employed are larger (by 20% in 2009) than those given in external statistics but estimates of number of contributors are 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. The over-estimation rises to 59% by 2012 because the EUROMOD estimate rises slowly but the external estimate falls, more sharply. EUROMOD does not capture the effect of people leaving self-employment during the recession, only the average change in income for those who remain in work.

Overall revenue from all contributions is underestimated, by 6% to 9%.

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 2009/10. 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.

In a similar way to the poverty estimates, the correction for non take-up improves the comparison. The Gini coefficient is increased by two points although there is still quite a large discrepancy between the HBAI estimate (0.36) and the EUROMOD estimate (0.32). One 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 only one percentage point higher than that from EUROMOD.) The correction uses information from tax statistics to inflate the incomes of some of the higher income households in the data (DWP, 2012). This has no effect on the median or poverty estimates but does affect the HBAI estimates shown in Table 4.8a for the Gini and the income share of the top decile group.³⁴ It also, by

³⁴ It does not seem to affect the median of the top decile group since the value of this taken from the FRS is higher rather than lower than the HBAI estimate. The definition of the “rich” in the 2009 HBAI data (who have their weights inflated and their income imputed from tax records) are working age individuals in GB with annual net income in excess of £150,000 or in N. Ireland in excess of £100,000. Those of pension age are treated similarly if they have annual gross income in excess of £60,000. It is

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) (2009/10).

The unshaded, panel shows the comparison of 2009/10 HBAI (Before Housing Costs) poverty statistics with EUROMOD's 2009 policy year. Because of differences due to using simulated rather than recorded income components and any differences in the precise sample or income concept³⁵ there is no reason to expect the HBAI and EUROMOD results to be identical. Also shown for 2009 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 higher poverty threshold (median) and the difference mainly impacts on poverty measured at the 50% threshold and poverty among older people, at 60% of the median. 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 11.8% compared with 17% in HBAI. Once the take-up correction is applied the EUROMOD estimate rises to 15.0%. The (rounded) poverty rate is also 2 percentage points too low relative to HBAI at the 50% threshold but the discrepancy is less than 1 percentage point at the 70% threshold.

At the 60% threshold the child poverty rate (after the take up adjustments) is 16.0% compared to 20% from HBAI. There are smaller discrepancies (2ppts) at the other two thresholds.

The comparisons for older people show that EUROMOD again underestimates at each threshold. At the 60% threshold the poverty rate for older people is 13.9% compared with 18% from HBAI.

Table 4.9a and Table 4.9b also compare HBAI poverty statistics using 2010 and 2011 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. While EUROMOD captures a small reduction in poverty risk (at 60% median) for the whole population, and also for children and the elderly 2009-11 (by somewhat less than 1 ppt in each case) poverty risk estimated by HBAI falls to a greater extent over this period: by 3ppts for children, 2ppts for the elderly and 1ppt for the population as a whole. This means that discrepancies between HBAI and EUROMOD estimates for 2011 are smaller than in 2009.

not possible to translate these individual income levels into equivalised household disposable income as used in the HBAI statistics.

³⁵ 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.

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 Income Support (and other working-age income tested benefits) and Housing benefits (Table 4.3). 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, mis-reporting 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 4.5), 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.

More work is required to fully understand the discrepancy in poverty rate estimates. This will include an examination of incomes at the median, which as shown by Table 4.9b are lower in EUROMOD than in HBAI.

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 be anyway 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 which, in 2009 and 2010 especially was very high.

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 (Pension Credit Guarantee; Council Tax Benefit) 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:

- UK results are based on FRS data, not data from the EU-SILC. These data relate to 2009/10.
- The reference time period for UK data is (generally) the last month, rather than the previous year (as for EU-SILC).

When using results from the 2010 to 2013 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 2009/10 (except those captured by updating by income source). In particular 2010 to 2013 baseline results do not capture the effects of recession on increased unemployment and inactivity or reductions in hours worked.

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.

5. REFERENCES

Department for Work and Pensions (2013), *Households Below Average Income 1994/95 – 2011/2012*, DWP: London.

Department for Work and Pensions (2012), *Households Below Average Income 1994/95 – 2010/2011*, DWP: London.

Department for Work and Pensions (2010), *Income Related Benefits Estimates of Take-Up in 2008/2009*. DWP: London.

HMRC (2010), *Child Tax Credit and Working Tax Credit Take-up Rates 2008-09*. HMRC: London.

6. SOURCES FOR TAX-BENEFIT DESCRIPTIONS/RULES

6.1 General sources for tax-benefit descriptions/rules

Child Poverty Action Group (2009) “Welfare Benefits and Tax Credits Handbook 2009/2010”, CPAG London

Child Poverty Action Group (2010) “Welfare Benefits and Tax Credits Handbook 2010/2011”, CPAG London

Child Poverty Action Group (2011) “Welfare Benefits and Tax Credits Handbook 2011/2012”, CPAG London

Child Poverty Action Group (2012) “Welfare Benefits and Tax Credits Handbook 2012/2013”, CPAG London

Child Poverty Action Group (2013) “Welfare Benefits and Tax Credits Handbook 2013/2014”, CPAG London

HMRC (2009) “Tax Benefit Reference Manual 2009-10 Edition”, HM Treasury 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

7.1 Annex 1: Uprating factors

Table 7.1 Uprating factors and their sources

Variable	Variable Label	Update factor	Factor Source
def_factor	default uprating factor	CPI	Eurostat CPI; financial year (April-March) average; extrapolated from Jan 2014 using UK OBR CPI forecast Table 3.5 ³⁶
yem	employment income	Average weekly Earnings index	ONS financial year (March-April) annual average K54U; extrapolated from Jan 2014 using UK OBR earnings forecast Table 3.5 ³⁷
yse	self-employment income	As employment income	
bdioa	Attendance allowance	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bdisc	Disability living allowance (self care)	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bdimb	Disability living allowance (mobility)	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bdict01	Incapacity benefit	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bdict02	ESA	As for Incapacity benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bdiwi	Industrial injuries pension	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bcrdi	Invalid care allowance	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
boact00	NI retirement pension	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bdisv	Severe disability allowance	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bhlwk	Statutory sick pay	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory

³⁶ <http://cdn.budgetresponsibility.independent.gov.uk/December-2013-Economic-and-fiscal-outlook23423423.pdf>

³⁷ <http://cdn.budgetresponsibility.independent.gov.uk/December-2013-Economic-and-fiscal-outlook23423423.pdf>

			indexation for projections
bunct	Unemployment benefit	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
boawr	War pension	Change in main rate of benefit	³⁸
bsuwd	Widow`s pension	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bmana	Maternity Allowance	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
bmaer	Statutory maternity pay	Change in main rate of benefit	DWP/HMT/HMRC announcements plus statutory indexation for projections
xhcmomi	Mortgage interest payment	Change in the mortgage interest rate (annual average)	Bank of England IUMTLMV ³⁹ ; extrapolated assuming moves with trend (2 years) ONS ⁴⁰ ; extrapolated to 2014 using same method as for earnings
xhcrt	Rent	Rent element of CPI	
bhoen30	Local reference rent 30th percentile	As rent	
bhoen50	Local reference rent 50th percentile	As rent	
bhoen1130	Local reference rent 30th percentile	As rent	
yot01	Earnings from odd jobs	As employment income	
yot02	Last earnings for those no longer working	As employment income	
yprnt	Income from rent received (not taxable)	As rent	
yprtx	Income from rent received (taxable)	As rent	
ypr	Total income from rent received	As rent	
xcc	Childcare costs expenditure	As employment income	
xhcot	Other housing costs	As rent	
xhcsc	Housing costs - service charges	As rent	
xmp	Maintenance paid	As employment income	
yptmp	Income from maintenance received	As employment income	
yptot	Other private transfers	As employment income	
xpp	Private and personal pension contributions	As employment income	

³⁸ <http://www.veterans-uk.info/publications/leaflets.html>

³⁹

<http://www.bankofengland.co.uk/boeapps/iadb/index.asp?first=yes&SectionRequired=I&HideNums=-1&ExtraInfo=true&Travel=NixIRxSUx>

⁴⁰ <http://www.ons.gov.uk/ons/rel/cpi/consumer-price-indices/october-2013/consumer-price-inflation-reference-tables.xls>

yls	Lump sum income	CPI	
ypp	Personal pension income	CPI	
			CIPFA statistics by region until no longer available (2010) then government announcements (HMT) by country; projections use OBR assumptions.
tmu	Council tax	Change in average band D Council Tax by country	

7.2 Annex 2: Comparison of simulated estimates of income tax with administrative statistics, UK 2010/11

Here we illustrate of the type of validation of simulated income tax that can be carried out when published tables from administrative data of tax revenue by income band are available. The exercise also suggests ways in which the input micro-data might be adjusted, or not. Here, the input data are the UK Family Resources Survey (FRS) 2009/10 updated to 2010/11 incomes and prices.

Simulated income tax liabilities are compared with statistics on income tax paid by band of taxable income, published by the UK revenue authority (HMRC, Table 3.3). The first point to note is that tax paid in any year may not match liability for tax on income earned in that year, because of adjustments carried over from previous years.

The first row in the top panel of the table below shows the ratio of microsimulation model (EUROMOD) estimates to those of HMRC in three dimensions: the number of taxpayers (defined as individuals with positive taxable income before deduction of any personal allowances), their total taxable income (before deduction of allowances), and the total tax liability/revenue. The number of taxpayers is under-estimated by 7% and taxable income by more: 13%. Also shown are the ratios for the lowest taxable income group (under £10,000 per year) and highest income group (over £150,000).⁴¹

Table 2 Ratio of EUROMOD estimates to HMRC statistics

	Taxpayers	Taxable income	Tax revenue
EUROMOD			
All	0.93	0.87	0.85
taxable income < £10K	0.99	0.98	0.76
taxable income £150K+	0.46	0.42	0.46
EUROMOD with proportional adjustment to number of taxpayers (adj1)			
All	1.00	0.93	0.91
taxable income < £10K	1.06	1.05	0.82
taxable income £150K+	0.50	0.45	0.49
EUROMOD with adjustment to number of taxpayers by income band (adj2)			
All	1.00	0.98	1.05

⁴¹ The HMRC statistics provide more detail for top incomes (the top two groups being £0.5 million to £1 million and £1million+). However, although the overall sample size of the FRS is large by international standards (31,644 individuals in 2009/10) the numbers with very high incomes are too small to analyse. There are 99 observations with taxable income in excess of £150,000, including 13 with more than £500,000 and just 2 with more than £1 million (after adjustment to 2010/11 income levels). As explained in the main text, this is partly due to under-representation of, or under reporting by, people with very high incomes in the survey. However, even if their incomes were properly represented, based on the HMRC statistics there would still be fewer than 30 observations with incomes above £500,000 in a sample of this size.

taxable income < £10K	1.00	1.00	0.79
taxable income £150K+	1.00	0.89	0.98

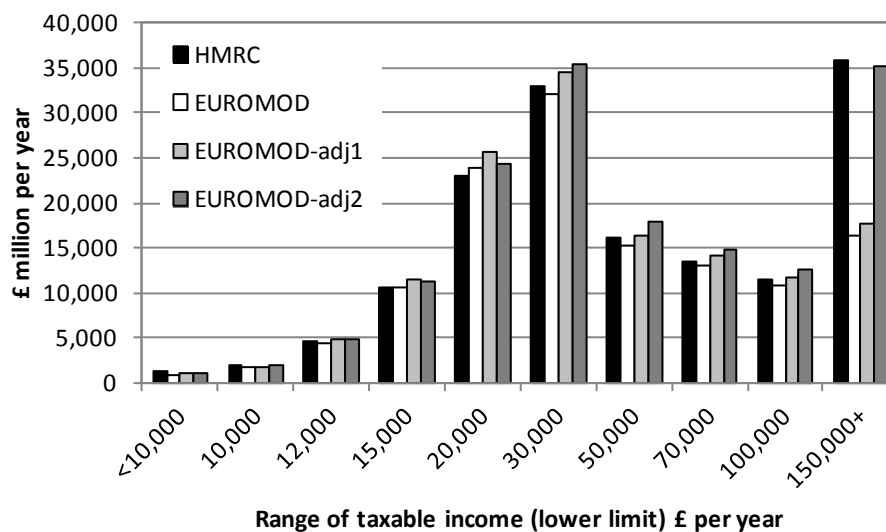
Notes: EUROMOD-adj1 makes a proportional adjustment to the number of taxpayers in each income group, to match HMRC. EUROMOD-adj2 adjusts the number of taxpayers in each income group to match those given by HMRC. Sources: EUROMOD version F6.20 using Family Resources Survey 2009/10 updated to 2010/11 incomes. HMRC <http://www.hmrc.gov.uk/statistics/income-by-year.htm> 2010-11 Table 3.3.

The low income group and their taxable income is well-represented by the FRS data but the tax revenue simulated by EUROMOD is too low by 24%. This can be explained as the difference in tax liability based on current year incomes (EUROMOD calculations) and tax revenue (HMRC) if the latter contains tax due on higher previous year incomes, for example by the self-employed. The symmetrical effect (revenue smaller than liability, as incomes rise), which in general is equally likely, is not observable because it is distributed throughout the rest of the distribution of taxable income.

The high income group of taxpayers and their income and tax paid are all under-represented by more than 50%. This is consistent with either or both the under-representation of very high income-earners in the survey, or the under-reporting of high incomes.

More detail of the pattern of tax revenue by range of taxable income can be seen in the Figure below. The black bars show the HMRC estimates and the white bars, those using EUROMOD simulations. EUROMOD shows some shortfall in most income ranges but the effect is concentrated in the highest income group.

Figure 1 Estimates of income tax revenue by range of taxable income 2010/11



Notes and sources: see the Table above.

The overall shortfall in taxpayers might be explained by under-reporting of income by the whole distribution or parts of it, or by the fact that a proportion of UK income taxpayers are not resident in UK households and hence not captured by the survey data.⁴² We carry out two adjustments to the comparison of EUROMOD and HMRC statistics (not to the micro-data) in order to explore these possibilities. First (adj1) we make a proportional adjustment to the three statistics reported in the table such that the total number of taxpayers matches that given by

⁴² We do not pursue this second possibility further.

HMRC (i.e. an increase of 7% in the EUROMOD statistic). The middle panel in the table shows that this has the effect of reducing the overall shortfall in taxable income and tax revenue by almost half but does little to rectify the shortfalls in the top income group. The effect on tax revenue in each income group is shown by the pale grey bars in the Figure. This suggests that a general tendency to under-report is part of the explanation for the shortfall in tax revenue but not the whole story.

A second adjustment adjusts taxable income and tax revenue by the shortfall in taxpayers within each income group. The effect of this is shown by the darker-grey bar in the figure and the bottom panel in the table. The overall shortfall in taxable income all but disappears but tax revenue is over-estimated by 5%. The shortfall in taxable income in the top income group is greatly reduced to 11% while tax revenue almost matches that in HMRC statistics for this group. The remaining shortfall in taxable income at the top suggests that there is a problem of lack of response by high income earners. The relative over-estimation of tax revenue suggests that the simulation of tax liability is missing the effect of some tax reliefs and deductions that cannot be simulated due to lack of information in the data. Tax evasion is also a possible explanation. From the figure, it seems that these effects are more important at higher incomes.

To summarise, the validation exercise of the simulated income tax in the UK component of EUROMOD provides some useful insights that should be considered in interpreting microsimulation results for other countries as well, although of course the specific explanations may differ and additional factors may be present. The UK FRS data appear to (a) under-represent people with high taxable incomes, and (b) under-report taxable incomes to some degree, across the whole distribution, although in countries characterised by large tax evasion the taxable income reported in the survey can be larger than the one reported in the tax revenue statistics. Simulated tax liabilities do not match tax revenue statistics because of between-year adjustments. The income tax simulations do not take account of all reliefs and deductions, nor of tax evasion, and this may lead to over-estimation of tax payments particularly towards the top of the distribution.

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/FRS					External					Ratio				
	2009	2010	2011	2012	2013	2009/10	2010/11	2011/12	2012/13	2013/14	2009	2010	2011	2012	2013
Benefits															
Incapacity benefit+ c-ESA	1,263	1,216	1,123	1,022	923	1344	1291	1230	1033	826	0.94	0.94	0.91	0.99	1.12
Incapacity benefit c-ESA	1,161	1,040	784	556	274	1177	1054	909	566	204	0.99	0.99	0.86	0.98	1.34
Retirement Pension Second State Pension	11,172	11,172	11,172	10,899	10,899	11418	11543	11613	11727	11776	0.98	0.97	0.96	0.93	0.93
Bereavement Benefits	7,606	7,606	7,606	7,606	7,606	9052	9320	9549	9850	10050	0.84	0.82	0.80	0.77	0.76
Jobseeker's Allowance (contributory)	111	111	111	111	111	119	112	106	102	93	0.93	0.99	1.05	1.09	1.19
Attendance Allowance	214	214	214	214	214	351	256	231	197	171	0.61	0.84	0.93	1.09	1.25
Disability Living Allowance (either part)	1,009	1,009	1,009	1,009	1,009	1776	1782	1756	1710	1691	0.57	0.57	0.57	0.59	0.60
Severe Disablement Allowance	2,485	2,485	2,485	2,485	2,383	3106	3177	3224	3278	3270	0.80	0.78	0.77	0.76	0.73
Carer's Allowance	140	140	140	140	140	240	230	220	211	202	0.58	0.61	0.64	0.66	0.69
Industrial Injuries Disablement	412	412	412	412	412	521	553	584	618	645	0.79	0.75	0.71	0.67	0.64
	158	158	158	158	158	325	327	324	318	314	0.49	0.48	0.49	0.50	0.50

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Allowance																
Maternity allowances	42	42	42	42	42	56	54	57	60	60	0.75	0.78	0.74	0.70	0.70	
War Pension and allowances	81	81	81	81	81	191	175	165	156	0	0.42	0.46	0.49	0.52	N/A	
Statutory Maternity Pay	175	175	175	175	175	253	274	273	276	278	0.69	0.64	0.64	0.63	0.63	
Taxes and Social Insurance contributions																
Council tax (payers)	25,528	25,528	25,528	25,528	25,528	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-2013>

War Pension and allowances: War Pensions Quarterly Statistics (mean of June, Sep, Dec and Mar):

<http://www.dasa.mod.uk/applications/newWeb/www/index.php?page=67&pubType=1&thiscontent=500&date=2009-09-10>

Note: c-ESA is contributory Employment and Support Allowance

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

	EUROMOD/FRS					External					Ratio				
	2009	2010	2011	2012	2013	2009/10	2010/11	2011/12	2012/13	2013/14	2009	2010	2011	2012	2013
Benefits															
Incapacity benefit+ c-ESA	6,045	6,032	5,730	5,529	5,111	6,689	6,511	6,338	5,581	4,667	0.90	0.93	0.90	0.99	1.10
Incapacity benefit c-ESA	5,672	5,174	4,021	3,031	1,538	6,108	5,556	4,940	3,276	1,229	0.93	0.93	0.81	0.93	1.25
Retirement Pension Second State Pension	50,543	51,816	54,202	55,660	57,057	49,143	51,139	54,249	57,823	59,893	1.03	1.01	1.00	0.96	0.95
Bereavement Benefits	591	605	624	657	671	650	614	593	593	584	0.91	0.99	1.05	1.11	1.15
Jobseeker's Allowance (contributory)	685	706	719	756	764	1,089	802	745	662	543	0.63	0.88	0.96	1.14	1.41
Attendance Allowance	3,002	3,047	3,141	3,305	3,377	5,106	5,228	5,339	5,476	5,414	0.59	0.58	0.59	0.60	0.62
Disability Living Allowance (either part)	8,362	8,488	8,750	9,205	8,208	11,459	11,877	12,566	13,430	13,708	0.73	0.71	0.70	0.69	0.60
Severe Disablement Allowance	502	520	550	603	628	907	888	881	887	874	0.55	0.59	0.62	0.68	0.72
Carer's Allowance	1,184	1,202	1,239	1,304	1,333	1,495	1,572	1,733	1,927	2,081	0.79	0.76	0.71	0.68	0.64
Industrial Injuries Disablement Allowance	346	352	363	381	390	844	888	888	905	907	0.41	0.40	0.41	0.42	0.43
Maternity	250	254	262	276	278	345	343	366	395	402	0.73	0.74	0.72	0.70	0.69

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allowances															
War Pension and allowances	362	367	379	398	407	1,020	953	944	1,000	N/A	0.35	0.39	0.40	0.40	N/A
Statutory Maternity Pay	1,010	1,025	1,056	1,111	1,122	2,026	2,141	2,200	2,303	2,339	0.50	0.48	0.48	0.48	0.48

Taxes and Social Insurance contributions

Council tax (payers)	29,536	30,036	30,077	30,185	30,446	24,943	25,464	30,100	30,400	N/A	1.18	1.18	1.00	0.99	N/A
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Sources: Unless otherwise specified: Department for Work and Pensions <https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2013>

War Pension and allowances: UK Blue Book Table 5.2.4S <http://www.ons.gov.uk/ons/rel/naa1-rd/united-kingdom-national-accounts/the-blue-book--2012-edition/index.html>

Council Tax: EFO supplementary fiscal table (OBR Budget 2013) downloaded from

http://statistics.dwp.gov.uk/asd/asd4/index.php?page=medium_term . External figures for 2009 and 2010 are from a different source and show Council tax net of Council tax benefit.

Note: c-ESA is contributory Employment and Support Allowance

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

		EUROMOD					External					Ratio				
		2009	2010	2011	2012	2013	2009/10	2010/11	2011/12	2012/13	2013/14	2009	2010	2011	2012	2013
Unit																
Benefits																
Child Benefit	Children	12,874	12,874	12,874	12,874	12,874	13,604	13,685	13,721	13,772	N/A	0.95	0.94	0.94	0.93	N/A
	Families	7,682	7,682	7,682	7,682	7,682	7,770	7,842	7,885	7,920	N/A	0.99	0.98	0.97	0.97	N/A
Working Tax credit (all)	Families	2,725	2,656	2,481	2,279	2,162	2,374	2,508	2,444	N/A	N/A	1.15	1.06	1.02	N/A	N/A
Child Tax Credit (all)	Families	6,560	6,523	5,376	4,312	4,252	4,283	4,302	3,685	N/A	N/A	1.53	1.52	1.46	N/A	N/A
Both CTC and WTC	Families	1,603	1,573	1,477	1,313	1,260	1,892	1,964	1,904	N/A	N/A	0.85	0.80	0.78	N/A	N/A
Either CTC or WTC	Families	7,683	7,606	6,379	5,279	5,154	6,249	6,308	5,670	N/A	N/A	1.23	1.21	1.13	N/A	N/A
Without children (WTC only)	Families	1,122	1,083	1,003	965	901	482	544	540	N/A	N/A	2.33	1.99	1.86	N/A	N/A
Income Support+JSAinc	Families	3,796	3,790	3,711	3,806	3,698	3,037	2,894	2,845	2,502	2,020	1.25	1.31	1.30	1.52	1.83
inc ESA	Families	718	735	770	840	891	190	313	483	887	1,228	3.78	2.35	1.59	0.95	0.73
Income Support+JSAinc+inc ESA	Families	4,514	4,525	4,481	4,646	4,590	3,227	3,207	3,328	3,389	3,248	1.40	1.41	1.35	1.37	1.41
Income Support lone parents only	Families	711	732	724	720	714	706	653	589	534	490	1.01	1.12	1.23	1.35	1.46
Pension credit - any	Families	3,520	3,523	3,428	3,181	3,105	2,736	2,718	2,649	2,505	2,376	1.29	1.30	1.29	1.27	1.31
Pension Credit GC only	Families	1,241	1,269	1,253	1,254	1,267	942	951	958	1,002	950	1.32	1.33	1.31	1.25	1.33
Pension Credit GC+SC	Families	1,084	1,030	995	877	834	1,205	1,186	1,108	948	894	0.90	0.87	0.90	0.93	0.93
Pension Credit SC only	Families	1,196	1,224	1,180	1,050	1,004	589	581	583	555	532	2.03	2.11	2.02	1.89	1.89
Housing benefit: total	Households	5,475	5,608	5,526	5,472	5,289	4,547	4,798	4,932	5,053	5,046	1.20	1.17	1.12	1.08	1.05
Council tax benefit	Households	8,680	9,041	8,832	8,709	8,541	5,571	5,805	5,874	5,911	N/A	1.56	1.56	1.50	1.47	N/A
Winter fuel payment	Households	13,326	13,326	13,326	12,636	12,636	12,681	12,783	12,686	12,764	12,659	1.05	1.04	1.05	0.99	1.00
Benefit cap	Families	0	0	0	0	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Taxes and Social Insurance contributions																
Income tax	Individuals	29,780	29,985	29,429	29,043	28,535	30,300	30,600	30,400	30,000	N/A	0.98	0.98	0.97	0.97	N/A
SIC Employees (Class 1)	Individuals	19,737	19,794	18,985	18,851	18,892	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)	Individuals	2,435	2,459	2,426	2,339	2,342	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-2013>

Income tax: HMRC statistics <https://www.gov.uk/government/publications/numbers-of-taxpayers-and-registered-traders>

Child tax credit and working tax credit: HMRC statistics <https://www.gov.uk/government/publications/child-and-working-tax-credits-statistics-finalised-annual-awards-2011-to-2012>

Child benefit: HMRC statistics <https://www.gov.uk/government/collections/child-benefit-geographical-statistics>

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

		EUROMOD					External					Ratio				
		2009	2010	2011	2012	2013	2009/10	2010/11	2011/12	2012/13	2013/14	2009	2010	2011	2012	2013
Unit																
Benefits																
Child Benefit	Children	12,874	12,874	12,874	12,874	12,874	13,604	13,685	13,721	13,772	N/A	0.95	0.94	0.94	0.93	N/A
	Families	7,682	7,682	7,682	7,682	7,682	7,770	7,842	7,885	7,920	N/A	0.99	0.98	0.97	0.97	N/A
Working Tax credit (all)	Families	1,615	1,585	1,469	1,328	1,274	2,374	2,508	2,444	N/A	N/A	0.68	0.63	0.60	N/A	N/A
Child Tax Credit (all)	Families	5,234	5,207	4,335	3,531	3,481	4,283	4,302	3,685	N/A	N/A	1.22	1.21	1.18	N/A	N/A
Both CTC and WTC	Families	1,302	1,281	1,204	1,077	1,035	1,892	1,964	1,904	N/A	N/A	0.69	0.65	0.63	N/A	N/A
Either CTC or WTC	Families	5,547	5,511	4,600	3,782	3,720	6,249	6,308	5,670	N/A	N/A	0.89	0.87	0.81	N/A	N/A
Without children (WTC only)	Families	313	305	265	250	238	482	544	540	N/A	N/A	0.65	0.56	0.49	N/A	N/A
Income Support+JSAinc	Families	3,137	3,133	3,069	3,131	3,044	3,037	2,894	2,845	2,502	2,020	1.03	1.08	1.08	1.25	1.51
inc ESA	Families	568	586	614	671	710	190	313	483	887	1,228	2.99	1.87	1.27	0.76	0.58
Income Support+JSAinc+inc ESA	Families	3,706	3,720	3,683	3,802	3,754	3,227	3,207	3,328	3,389	3,248	1.15	1.16	1.11	1.12	1.16
Income Support lone parents only	Families	636	653	645	641	636	706	653	589	534	490	0.90	1.00	1.10	1.20	1.30
Pension credit - any	Families	2,341	2,329	2,281	2,130	2,073	2,736	2,718	2,649	2,505	2,376	0.86	0.86	0.86	0.85	0.87
Pension Credit GC only	Families	954	977	970	971	976	942	951	958	1,002	950	1.01	1.03	1.01	0.97	1.03
Pension Credit GC+SC	Families	819	784	756	663	633	1,205	1,186	1,108	948	894	0.68	0.66	0.68	0.70	0.71
Pension Credit SC only	Families	567	568	555	496	464	589	581	583	555	532	0.96	0.98	0.95	0.89	0.87
Housing benefit: total	Households	4,470	4,522	4,478	4,446	4,327	4,547	4,798	4,932	5,053	5,046	0.98	0.94	0.91	0.88	0.86
Council tax benefit	Households	6,340	6,551	6,426	6,361	6,261	5,571	5,805	5,874	5,911	N/A	1.14	1.13	1.09	1.08	N/A
Winter fuel payment	Households	13,326	13,326	13,326	12,636	12,636	12,681	12,783	12,686	12,764	12,659	1.05	1.04	1.05	0.99	1.00

Taxes and Social Insurance contributions

Income tax	Individuals	29,780	29,985	29,429	29,043	28,535	30,300	30,600	30,400	30,000	0	0.98	0.98	0.97	0.97	N/A
SIC Employees (Class 1)	Individuals	19,737	19,794	18,985	18,851	18,892	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)	Individuals	2,435	2,459	2,426	2,339	2,342	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-2013>

Income tax: HMRC statistics <https://www.gov.uk/government/publications/numbers-of-taxpayers-and-registered-traders>

Child tax credit and working tax credit: HMRC statistics <https://www.gov.uk/government/publications/child-and-working-tax-credits-statistics-finalised-annual-awards-2011-to-2012>

Child benefit: HMRC statistics <https://www.gov.uk/government/collections/child-benefit-geographical-statistics>

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

	EUROMOD					External					Ratio				
	2009	2010	2011	2012	2013	2009/10	2010/11	2011/12	2012/13	2013/14	2009	2010	2011	2012	2013
Benefits															
Child Benefit	11,571	11,745	11,745	11,745	11,745	11,822	12,158	12,175	12,128	11,805	0.98	0.97	0.96	0.97	0.99
Working Tax credit (all)	6,204	6,184	5,839	5,264	5,045	7,675	8,069	7,734	N/A	N/A	0.81	0.77	0.75	N/A	N/A
Child Tax Credit (all)	18,626	18,976	19,367	19,652	19,574	19,696	20,474	21,469	N/A	N/A	0.95	0.93	0.90	N/A	N/A
CTC and WTC	24,830	25,160	25,206	24,916	24,619	27,601	28,543	29,203	29,929	30,018	0.90	0.88	0.86	0.83	0.82
Without children (WTC only)	1,924	1,900	1,819	1,789	1,696	1,134	1,298	1,304	N/A	N/A	1.70	1.46	1.39	N/A	N/A
Jobseeker's Allowance (contributory)	685	706	719	756	764	1,089	802	745	662	543	0.63	0.88	0.96	1.14	1.41
Income Support+JSAinc	13,100	13,442	13,787	14,916	14,774	11,969	11,452	10,593	8,904	7,237	1.09	1.17	1.30	1.68	2.04
inc ESA	3,818	3,982	4,314	4,922	5,169	686	1,277	2,156	4,475	6,733	5.56	3.12	2.00	1.10	0.77
Income Support+JSAinc+ESA	16,918	17,424	18,101	19,837	19,943	12,656	12,729	12,748	13,379	13,969	1.34	1.37	1.42	1.48	1.43
Income support lone parents only	2,353	2,547	2,606	2,735	2,752	2,842	2,620	2,417	2,046	1,834	0.83	0.97	1.08	1.34	1.50
Pension Credit Guarantee Credit	6,395	6,594	6,704	6,403	6,386	6,915	7,038	6,810	6,513	6,192	0.92	0.94	0.98	0.98	1.03
Pension Credit Savings Credit	1,480	1,473	1,418	1,134	1,047	1,214	1,204	1,243	998	924	1.22	1.22	1.14	1.14	1.13
Pension Credit total	7,874	8,067	8,122	7,537	7,433	8,129	8,242	8,052	7,511	7,116	0.97	0.98	1.01	1.00	1.04
Housing benefit: total	21,742	22,768	22,386	22,367	21,136	19,989	21,427	22,820	23,900	23,976	1.09	1.06	0.98	0.94	0.88
Council tax benefit	6,657	7,027	6,869	6,817	6,756	4,698	4,925	4,918	4,915	N/A	1.42	1.43	1.40	1.39	N/A
Winter fuel payment	2,709	2,709	2,121	2,038	2,038	2,735	2,760	2,150	2,144	2,152	0.99	0.98	0.99	0.95	0.95
all IS+PC+JSAinc	24,792	25,491	26,222	27,375	27,375	20,098	19,694	18,645	16,415	N/A	1.23	1.29	1.41	1.67	N/A

NOTE (1): Income Support also takes into account JSA means tested; ib-ESA is effectively simulated as part of IS in EUROMOD

Taxes and Social Insurance contributions															
Income tax	122,885	129,896	130,250	130,233	131,528	144,891	153,491	150,939	150,030	N/A	0.85	0.85	0.86	0.87	N/A
SIC Employees (Class 1)	37,208	37,999	39,305	39,102	39,711	37,179	38,500	40,160	41,194	N/A	1.00	0.99	0.98	0.95	N/A
SIC Employers	48,037	49,307	51,511	51,870	53,482	54,387	56,134	58,640	60,830	N/A	0.88	0.88	0.88	0.85	N/A
SIC Self employed (Class 2 + any Class4)	3,452	3,517	3,912	3,899	3,958	2,879	2,720	2,641	2,458	N/A	1.20	1.29	1.48	1.59	N/A
SIC total (any SIC)	88,697	90,823	94,728	94,871	97,151	94,445	97,354	101,441	104,482	N/A	0.94	0.93	0.93	0.91	N/A

Sources: Unless otherwise specified: Department for Work and Pensions <https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2013>

Income tax: HMRC statistics

Child tax credit and working tax credit: HMRC statistics <https://www.gov.uk/government/publications/child-and-working-tax-credits-statistics-finalised-annual-awards-2011-to-2012>

National Insurance Contributions: ONS Blue Book Table 5.2.4s

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

	EUROMOD					External					Ratio				
	2009	2010	2011	2012	2013	2009/10	2010/11	2011/12	2012/13	2013/14	2009	2010	2011	2012	2013
Benefits															
Child Benefit	11,571	11,745	11,745	11,745	11,745	11,822	12,158	12,175	12,128	11,805	0.98	0.97	0.96	0.97	0.99
Working Tax credit (all)	4,061	4,065	3,821	3,401	3,288	7,675	8,069	7,734	N/A	N/A	0.53	0.50	0.49	N/A	N/A
Child Tax Credit (all)	15,279	15,582	15,960	16,226	16,154	19,696	20,474	21,469	N/A	N/A	0.78	0.76	0.74	N/A	N/A
CTC and WTC	19,339	19,647	19,782	19,627	19,441	27,601	28,543	29,203	29,929	30,018	0.70	0.69	0.68	0.66	0.65
Without children (WTC only)	534	532	503	493	470	1,134	1,298	1,304	N/A	N/A	0.47	0.41	0.39	N/A	N/A
Jobseeker's Allowance (contributory)	685	706	719	756	764	1,089	802	745	662	543	0.63	0.88	0.96	1.14	1.41
Income Support+JSAinc	10,842	11,121	11,430	12,297	12,205	11,969	11,452	10,593	8,904	7,237	0.91	0.97	1.08	1.38	1.69
inc ESA	3,060	3,211	3,474	3,961	4,174	686	1,277	2,156	4,475	6,733	4.46	2.51	1.61	0.89	0.62
Income Support+JSAinc+ESA	13,901	14,331	14,904	16,258	16,380	12,656	12,729	12,748	13,379	13,969	1.10	1.13	1.17	1.22	1.17
Income support lone parents only	2,104	2,275	2,325	2,440	2,459	2,842	2,620	2,417	2,046	1,834	0.74	0.87	0.96	1.19	1.34
Pension Credit Guarantee Credit	4,939	5,096	5,210	5,020	5,046	6,915	7,038	6,810	6,513	6,192	0.71	0.72	0.77	0.77	0.81
Pension Credit Savings Credit	905	888	859	687	634	1,214	1,204	1,243	998	924	0.75	0.74	0.69	0.69	0.69
Pension Credit total	5,844	5,983	6,069	5,707	5,680	8,129	8,242	8,052	7,511	7,116	0.72	0.73	0.75	0.76	0.80
Housing benefit: total	18,663	19,279	19,010	19,026	18,038	19,989	21,427	22,820	23,900	23,976	0.93	0.90	0.83	0.80	0.75
Council tax benefit	5,091	5,334	5,232	5,208	5,170	4,698	4,925	4,918	4,915	N/A	1.08	1.08	1.06	1.06	N/A
Winter fuel payment	2,709	2,709	2,121	2,038	2,038	2,735	2,760	2,150	2,144	2,152	0.99	0.98	0.99	0.95	0.95
all IS+PC+JSAinc	19,746	20,314	20,972	21,965	22,059	20,098	19,694	18,645	16,415	N/A	0.98	1.03	1.12	1.34	N/A

NOTE (1): Income Support also takes into account JSA means tested; ib-ESA is effectively simulated as part of IS in EUROMOD

Taxes and Social Insurance contributions															
Income tax	122,885	129,896	130,250	130,233	131,528	144,891	153,491	150,939	150,030	N/A	0.85	0.85	0.86	0.87	N/A
SIC Employees (Class 1)	37,208	37,999	39,305	39,102	39,711	37,179	38,500	40,160	41,194	N/A	1.00	0.99	0.98	0.95	N/A
SIC Employers	48,037	49,307	51,511	51,870	53,482	54,387	56,134	58,640	60,830	N/A	0.88	0.88	0.88	0.85	N/A
SIC Self employed (Class 2 + any Class4)	3,452	3,517	3,912	3,899	3,958	2,879	2,720	2,641	2,458	N/A	1.20	1.29	1.48	1.59	N/A
SIC total (any SIC)	88,697	90,823	94,728	94,871	97,151	94,445	97,354	101,441	104,482	N/A	0.94	0.93	0.93	0.91	N/A

Sources: Unless otherwise specified: Department for Work and Pensions <https://www.gov.uk/government/publications/benefit-expenditure-and-caseload-tables-2013>

Income tax: HMRC statistics

Child tax credit and working tax credit: HMRC statistics <https://www.gov.uk/government/publications/child-and-working-tax-credits-statistics-finalised-annual-awards-2011-to-2012>

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)				
	2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013				
Gini	0.30	0.30	0.29	0.29	0.30	0.33	0.36	0.34	0.34	N/A	N/A	0.92	0.84	0.88	0.87	N/A	N/A										
S80/S20	4.35	4.27	4.22	4.21	4.31	5.34	N/A	N/A	N/A	N/A	N/A	0.81	N/A	N/A	N/A	N/A	N/A										
Mean	1,408	1,432	1,465	1,496	1,531	1,551	1,494	1,476	1,525	N/A	N/A	0.91	0.94	0.97	0.96	N/A	N/A										
Median	1,165	1,189	1,222	1,248	1,274	1,277	1,193	1,210	1,234	N/A	N/A	0.91	0.98	0.98	0.99	N/A	N/A										
Decile medians (£/month equivalised)																											
D1	588	601	620	637	641	529	462	480	508	N/A	N/A	1.11	1.27	1.25	1.22	N/A	N/A										
D2	736	756	782	800	806	744	682	711	725	N/A	N/A	0.99	1.08	1.06	1.08	N/A	N/A										
D3	846	870	894	915	924	893	829	849	870	N/A	N/A	0.95	1.02	1.02	1.03	N/A	N/A										
D4	957	980	1,007	1,030	1,043	1,037	962	985	1,011	N/A	N/A	0.92	0.99	1.00	1.00	N/A	N/A										
D5	1,088	1,112	1,143	1,166	1,187	1,195	1,109	1,132	1,156	N/A	N/A	0.91	0.98	0.98	0.99	N/A	N/A										
D6	1,248	1,274	1,307	1,334	1,372	1,370	1,274	1,294	1,323	N/A	N/A	0.91	0.98	0.98	0.99	N/A	N/A										
D7	1,434	1,463	1,494	1,528	1,573	1,580	1,476	1,482	1,522	N/A	N/A	0.91	0.97	0.99	0.98	N/A	N/A										
D8	1,672	1,704	1,745	1,786	1,848	1,855	1,722	1,719	1,782	N/A	N/A	0.90	0.97	0.99	0.98	N/A	N/A										
D9	2,060	2,099	2,144	2,192	2,262	2,285	2,120	2,109	2,178	N/A	N/A	0.90	0.97	1.00	0.98	N/A	N/A										
D10	2,921	2,975	3,022	3,080	3,169	3,340	3,175	3,108	3,207	N/A	N/A	0.87	0.92	0.96	0.94	N/A	N/A										
Decile group share																											
D1	3.8	3.9	3.9	3.9	3.8	2.9	3.0	3.0	3.0	N/A	N/A	1.32	1.28	1.29	1.30	N/A	N/A										
D2	5.2	5.3	5.3	5.3	5.2	4.8	4.0	5.0	5.0	N/A	N/A	1.09	1.31	1.06	1.06	N/A	N/A										
D3	6.0	6.1	6.1	6.1	6.0	5.7	6.0	7.0	7.0	N/A	N/A	1.05	1.00	0.87	0.87	N/A	N/A										
D4	6.8	6.9	6.9	6.9	6.8	6.7	6.0	7.0	7.0	N/A	N/A	1.01	1.13	0.98	0.98	N/A	N/A										
D5	7.7	7.8	7.8	7.8	7.8	7.7	8.0	8.0	8.0	N/A	N/A	1.01	0.97	0.97	0.98	N/A	N/A										
D6	8.9	8.9	8.9	8.9	9.0	8.8	8.0	8.0	8.0	N/A	N/A	1.00	1.11	1.11	1.12	N/A	N/A										
D7	10.2	10.2	10.2	10.2	10.3	10.2	10.0	10.0	10.0	N/A	N/A	1.00	1.02	1.02	1.02	N/A	N/A										
D8	11.9	12.0	12.0	12.0	12.1	12.0	12.0	12.0	12.0	N/A	N/A	0.99	0.99	1.00	1.00	N/A	N/A										
D9	14.7	14.7	14.7	14.7	14.9	14.9	14.0	14.0	14.0	N/A	N/A	0.99	1.05	1.05	1.05	N/A	N/A										
D10	24.8	24.4	24.2	24.1	24.1	26.3	29.0	27.0	28.0	N/A	N/A	0.94	0.85	0.90	0.86	N/A	N/A										

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

EUROMOD	External (FRS)					External (HBAI)					Ratio (EM/FRS)					Ratio (EM/HBAI)				
	2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013			
Gini	0.32	0.31	0.31	0.31	0.31	0.33	0.36	0.34	0.34	N/A	N/A	0.97	0.88	0.93	0.92	N/A	N/A			
S80/S20	5.04	4.97	4.90	4.88	5.02	5.34	#N/A	#N/A	#N/A	N/A	N/A	0.94	#N/A	#N/A	#N/A	N/A	N/A			
Mean	1,378	1,400	1,434	1,465	1,500	1,551	1,494	1,476	1,525	N/A	N/A	0.89	0.92	0.95	0.94	N/A	N/A			
Median	1,142	1,167	1,200	1,228	1,258	1,277	1,193	1,210	1,234	N/A	N/A	0.89	0.96	0.96	0.97	N/A	N/A			
Decile medians (£/month equivalised)																				
D1	477	486	504	514	507	529	462	480	508	N/A	N/A	0.90	1.03	1.01	0.99	N/A	N/A			
D2	685	702	726	745	748	744	682	711	725	N/A	N/A	0.92	1.00	0.99	1.00	N/A	N/A			
D3	809	828	856	878	887	893	829	849	870	N/A	N/A	0.91	0.98	0.98	0.98	N/A	N/A			
D4	929	951	980	1,003	1,020	1,037	962	985	1,011	N/A	N/A	0.90	0.97	0.97	0.97	N/A	N/A			
D5	1,065	1,086	1,119	1,143	1,167	1,195	1,109	1,132	1,156	N/A	N/A	0.89	0.96	0.96	0.97	N/A	N/A			
D6	1,231	1,257	1,292	1,322	1,359	1,370	1,274	1,294	1,323	N/A	N/A	0.90	0.97	0.97	0.98	N/A	N/A			
D7	1,423	1,449	1,486	1,519	1,565	1,580	1,476	1,482	1,522	N/A	N/A	0.90	0.96	0.98	0.98	N/A	N/A			
D8	1,665	1,697	1,740	1,781	1,843	1,855	1,722	1,719	1,782	N/A	N/A	0.90	0.97	0.99	0.98	N/A	N/A			
D9	2,055	2,094	2,138	2,184	2,258	2,285	2,120	2,109	2,178	N/A	N/A	0.90	0.97	0.99	0.98	N/A	N/A			
D10	2,919	2,970	3,022	3,078	3,169	3,340	3,175	3,108	3,207	N/A	N/A	0.87	0.92	0.96	0.94	N/A	N/A			
Decile group share																				
D1	3.1	3.1	3.1	3.1	3.0	2.9	3.0	3.0	3.0	N/A	N/A	1.05	1.02	1.02	1.03	N/A	N/A			
D2	4.9	5.0	5.0	5.1	5.0	4.8	4.0	5.0	5.0	N/A	N/A	1.03	1.24	1.00	1.01	N/A	N/A			
D3	5.9	5.9	6.0	6.0	5.9	5.7	6.0	7.0	7.0	N/A	N/A	1.03	0.98	0.85	0.85	N/A	N/A			
D4	6.8	6.8	6.8	6.9	6.8	6.7	6.0	7.0	7.0	N/A	N/A	1.01	1.13	0.97	0.98	N/A	N/A			
D5	7.7	7.8	7.8	7.8	7.8	7.7	8.0	8.0	8.0	N/A	N/A	1.01	0.97	0.97	0.98	N/A	N/A			
D6	8.9	9.0	9.0	9.0	9.1	8.8	8.0	8.0	8.0	N/A	N/A	1.01	1.12	1.12	1.13	N/A	N/A			
D7	10.3	10.4	10.4	10.4	10.5	10.2	10.0	10.0	10.0	N/A	N/A	1.01	1.03	1.04	1.04	N/A	N/A			
D8	12.1	12.2	12.2	12.2	12.3	12.0	12.0	12.0	12.0	N/A	N/A	1.01	1.01	1.02	1.02	N/A	N/A			
D9	15.0	15.0	15.0	15.0	15.1	14.9	14.0	14.0	14.0	N/A	N/A	1.01	1.07	1.07	1.07	N/A	N/A			
D10	25.3	24.9	24.7	24.6	24.6	26.3	29.0	27.0	28.0	N/A	N/A	0.96	0.87	0.92	0.88	N/A	N/A			

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

EUROMOD		External (FRS)					External (HBAI)					Ratio (EM/FRS)					Ratio(EM/HBAI)				
		2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013			
Median (£/month)																					
		1,165	1,189	1,222	1,248	1,274	1,277	1,193	1,210	1,234	N/A	N/A	0.91	1.00	1.01	1.01	N/A	N/A			
Poverty risk: all																					
Total	50%	4.6	4.5	4.5	4.5	4.9	8.8	10	9.0	9.0	N/A	N/A	0.52	0.45	0.49	0.50	N/A	N/A			
	60%	11.8	11.4	11.3	11.1	12.1	16.6	17	16.0	16.0	N/A	N/A	0.71	0.67	0.71	0.70	N/A	N/A			
	70%	22.1	21.6	21.4	21.1	22.4	25.1	25	25.0	25.0	N/A	N/A	0.88	0.87	0.86	0.84	N/A	N/A			
Poverty risk: children																					
	50%	3.8	3.7	3.5	3.5	3.9	10.2	10	9	9	N/A	N/A	0.37	0.37	0.39	0.38	N/A	N/A			
	60%	11.7	11.0	10.4	9.9	11.4	20.1	20	18	17	N/A	N/A	0.58	0.55	0.58	0.58	N/A	N/A			
	70%	26.3	25.0	24.5	24.1	25.9	31.5	31	29	29	N/A	N/A	0.83	0.81	0.84	0.83	N/A	N/A			
Poverty risk: older people																					
	50%	1.5	1.3	1.3	1.4	1.4	7.4	9	9	8	N/A	N/A	0.20	0.14	0.14	0.17	N/A	N/A			
	60%	10.2	9.8	9.7	9.5	10.0	16.8	18	17	16	N/A	N/A	0.61	0.54	0.57	0.59	N/A	N/A			
	70%	21.2	20.9	20.5	19.6	21.3	27.5	28	28	27	N/A	N/A	0.77	0.75	0.73	0.73	N/A	N/A			

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

EUROMOD		External (FRS)					External (HBAI)					Ratio (EM/FRS) Ratio(EM/HBAI)						
		2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013	2009	2009	2010	2011	2012	2013
Median (£/month)		1,142	1,167	1,200	1,228	1,258	1,277	1,193	1,210	1,234	N/A	N/A	0.89	0.98	0.99	1.00	N/A	N/A
Poverty risk: all																		
Total	50%	8.1	8.0	7.9	7.9	8.5	8.8	10	9	9	N/A	N/A	0.91	0.80	0.88	0.88	N/A	N/A
	60%	15.0	14.9	14.6	14.5	15.3	16.6	17	16	16	N/A	N/A	0.91	0.87	0.91	0.91	N/A	N/A
	70%	24.2	24.0	23.7	23.5	24.6	25.1	25	25	25	N/A	N/A	0.96	0.96	0.95	0.94	N/A	N/A
Poverty risk: children																		
	50%	8.4	8.3	8.2	8.1	8.7	10.2	10	9	9	N/A	N/A	0.82	0.83	0.91	0.90	N/A	N/A
	60%	16.0	15.6	15.1	14.8	16.2	20.1	20	18	17	N/A	N/A	0.80	0.78	0.84	0.87	N/A	N/A
	70%	28.8	28.3	27.8	27.5	29.0	31.5	31	29	29	N/A	N/A	0.92	0.91	0.96	0.95	N/A	N/A
Poverty risk: older people																		
	50%	4.9	4.7	4.6	4.5	4.9	7.4	9	9	8	N/A	N/A	0.67	0.52	0.51	0.56	N/A	N/A
	60%	13.9	13.7	13.3	12.8	13.5	16.8	18	17	16	N/A	N/A	0.83	0.76	0.78	0.80	N/A	N/A
	70%	23.8	23.6	22.9	22.1	23.6	27.5	28	28	27	N/A	N/A	0.87	0.84	0.82	0.82	N/A	N/A