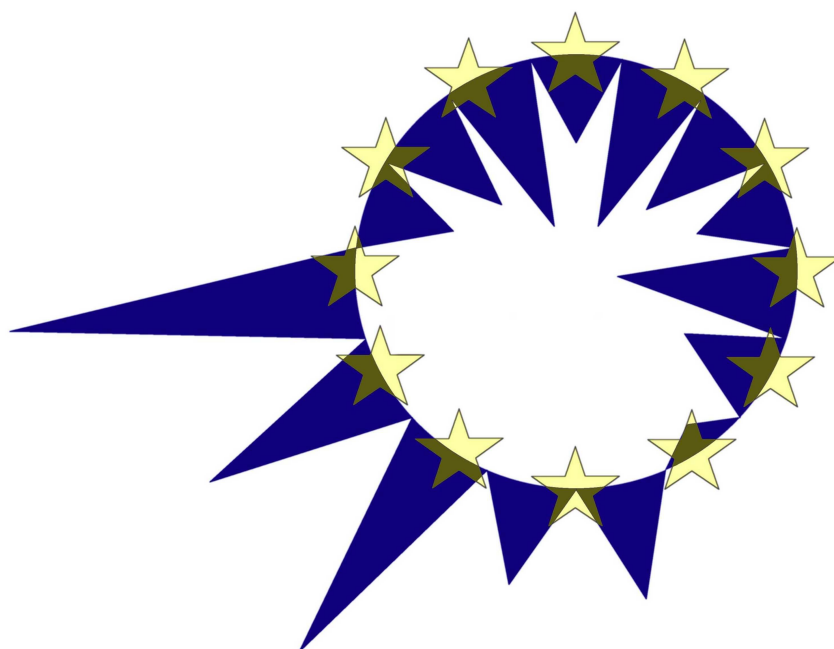


# **EUROMOD**

## **COUNTRY REPORT**



EUROMOD Country Report

**UNITED KINGDOM**

Holly Sutherland

July 2001



# EUROMOD Country Report - United Kingdom

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<sup>1</sup> I am grateful to Tony Atkinson for some very helpful comments and suggestions. The remaining errors are my own.

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## 1. Outline of the UK tax-benefit system in 1998

### Some basic information:

- The tax-benefit system is largely a unified, national system.<sup>2</sup> The main exceptions are *Council Tax* and *Council Tax Benefit* which do not apply in Northern Ireland and the *Social Fund*, the discretionary element of which is managed under fixed local budgets each year.
- The tax system generally changes in April each year. Main benefit changes happen at the same time, but may also be implemented in June or October.
- State pension age in 1998 was 60 for women and 65 for men.
- Minimum school leaving age is 16; dependent children are defined as aged under 16 or under 19 and in full-time non-advanced education and not married.
- For benefit purposes lone parents are the parents of resident dependent children; they do not cohabit with a partner of the opposite sex (whether or not any partner is the parent of the child is irrelevant); for tax purposes a lone parent is not legally married to anyone and is a parent of a dependent child.
- The income tax system is an individual system, with the spouses being assessed independently.
- 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 and state benefits and pensions are usually assessed and delivered on a weekly basis. Amounts are referred to in weekly terms. The exception is income tax, where liability is based on annual income and allowances and thresholds are referred to in annual terms.

### 1.1 Benefits<sup>3</sup>

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 which depends on having met certain conditions regarding *National Insurance contributions*. Some contributory benefits are subject to specific tests on current income. The second type is *non-contributory, non-means-tested* benefits. These benefits depend on certain contingencies such as disability or parenthood but do not require contributions to have been made and are not subject to an income test. The third type 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. The three types are reviewed separately below.

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

- 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

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<sup>2</sup> The way it operates in practice may vary across regions and by other characteristics.

<sup>3</sup> For more detailed information see (i) Tolley's *Social Security and State Benefits Handbook 1998-99*, Tolley's: Croydon; (ii) *National Welfare Benefits Handbook*, 28<sup>th</sup> edition 1998/99, Child Poverty Action Group: London; (iii) the Department of Social Security web site <http://www.dss.gov.uk/gbi/index.htm> is also useful.

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 6 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 donee families are on *Income Support*.
- Student grants were replaced by loans in September 1998. The grant was non-taxable and means-tested on parental income.
- Foster allowances are paid to families looking after children who are in Local Authority care (or similar).
- Training allowances are paid under various schemes. 1998 saw the start of the first New Deal (for young people), which is intended to be a comprehensive scheme to get people into work or training. The associated allowances are small and usually no more than Income Support (see below).

### *1.1.a Contributory benefits*

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

**Job Seeker’s Allowance:** contributory (JSA) is a benefit for the **unemployed**, conditional of active job search; no additions for dependants; duration is up to 6 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.

**Incapacity benefit:** benefit for the **sick and long-term incapacitated**, conditional on claimants inability to do own job (first 28 weeks) or any job (after that). A lower short term rate for those not eligible for SSP; higher short-term rate for weeks 29-52 of sickness. After that, a higher long term rate applies until state pension age; increases are paid for dependent children and spouses caring for children or aged over 60 (and not in receipt of own pension); additions for age in long term rate; taxable.

**Retirement pension:** if they meet the contribution conditions people **over state pension age** 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; additions are paid for dependent spouses under pension age and dependent children; basic pension is taxable.

For pensioners who contributed to the State Earnings Related Pension Scheme (SERPS) an additional earnings-related pension is payable. This is taxable and there are no additions for dependants.

**Widow’s benefit:** this is based on the late husband’s contributions; younger widows (under 45) do not qualify unless they have dependent children. Widow’s benefit is taxable. (Part of the husband’s SERPS entitlement and private pension can also be inherited.)

**Maternity benefit** is payable for 18 weeks if the claimant has herself met contribution conditions but she does not qualify for SMP. It is a flat rate benefit (there are two rates - a lower one for women not covered by an EC directive). There are no additions for dependants. Maternity benefit is not taxable.

#### *1.1.b Non-contributory, non-means-tested benefits*

**Child benefit** is a universal flat-rate benefit paid to the carer of **each dependent child**. There is a higher rate for eldest or only dependent children, otherwise the rate does not vary. Child benefit is not taxable.

**Lone parent benefit** is a per-family addition payable to lone parents.<sup>4</sup>

**Attendance allowance (AA)** is a flat-rate benefit payable for people who are so disabled or sick that they **need care** during the day, at night or both (higher rate); not taxable.

**Disability Living Allowance (DLA)** is for people who become disabled before the age of 65 and have **personal care and/or mobility needs**. The care component is paid at one of 3 rates and the mobility component at one of two rates, depending on severity of need; not taxable.

**Severe Disablement Allowance (SDA)** is for people with at least 80% disability who do not qualify for *Incapacity Benefit* and is paid at a lower rate; additional payments for dependants; not taxable.

**Invalid Care Allowance (ICA)** 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 *DLA care component* or *AA*; dependants additions; taxable.

**Industrial Injuries Disablement Benefit** is a benefit for people who are long-term incapacitated due to injury at work; non-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 Pension** is an "umbrella" term for a series of payments that may be made to people who have been disabled as a result of service in HM Forces (not necessarily in a war). Not taxable.

#### *1.1.c Means-tested benefits*

**Job Seeker's Allowance** (income tested) 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*.

**Income Support (IS)** is the main **social assistance** benefit for people whose family incomes are lower than a specified level and who are not in work (or in work for less than 16 hours per

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<sup>4</sup> From July 1998 lone parent benefit was abolished for new lone parents and phased out for existing claimants.

week). It is intended to apply to pensioners, lone parents, sick and disabled people and others who are not expected to seek work. 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. 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 capital are disqualified from IS altogether.

Income Support is assessed weekly. It is taxable.

Certain benefits-in-kind 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.

**Housing Benefit (HB)** covers rent. It is paid in full for IS recipients, subject to locally specified maxima. For those with higher incomes it is tapered away with additional income, using the same 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.

**Council Tax Benefit (CTB)** provides rebates on *Council Tax* for low income households; it has a structure similar to HB and is not taxable.

**Family Credit (FC)** is a benefit for families with dependent **children where at least one parent is in employment** or self-employment for at least 16 hours per week. The benefit is tapered away with income increases above a minimum level; income is assessed after income tax and contributions; the maximum amount of benefit depends on the number of children but is paid at the same rate for couples and lone parents; a higher amount is paid if at least 30 hours are worked per week by at least one parent; capital rules apply in a similar way as in *IS*; FC payments depend on income and circumstances in the few weeks before the claim, but entitlement lasts for 6 months, regardless of changes in income or circumstance. FC is taken into account in assessment of *HB* and *CTB*. It is not itself part of the income tax base.<sup>5</sup>

**Disability Working Allowance (DWA)** has a similar structure as *FC* but applies to **disabled people who are in paid work** for at least 16 hours per week (with or without children).

**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.

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<sup>5</sup> In 2000 FC was replaced by Working Families Tax Credit (WFTC). This has the same structure but has a more generous maximum payment and a lower taper; it is allowed as a refundable tax credit through the pay packet of the main earner rather than as a cash benefit paid to the carer of the children.



Table 1.1 provides an indication of the relative scale and coverage of each benefit by showing the number of recipients and the expenditure on each benefit. (The UK population in 1998 was 59.24 million. In Great Britain it was 57.55 million.<sup>6</sup> UK GDP was £860 billion in 1998/9.<sup>7</sup>)

**Table 1.1 Benefits by number of claimants and expenditure in 1998/9: Great Britain**

BENEFIT	Claimants (thousand)	Expenditure £m / year
<i>Contributory benefits</i>		
Job Seeker's Allowance (contributory)	177	521
Incapacity Benefit	2,373 <sup>a</sup>	6,332
Retirement Pension (basic)	10,834	31,916
Widow's Benefit	270	968
Maternity Benefit	n/a	39
<i>Non-contributory, non-means-tested benefits</i>		
Child Benefit	6,956 <sup>b</sup>	7,278 <sup>c</sup>
Lone Parent Benefit	1,037 <sup>b</sup>	
Attendance Allowance	1,232 <sup>d</sup>	2,682
Disability Living Allowance	1,980 <sup>e</sup>	5,331
Severe Disablement Allowance	385 <sup>f</sup>	993
Invalid Care Allowance	373 <sup>b</sup>	781
Industrial Injuries Disablement Benefit	276 <sup>b</sup>	712
Guardian's Allowance	2	~
War Pension	310 <sup>b</sup>	1,272
<i>Means-tested benefits</i>		
Job Seeker's Allowance (means-tested)	1,027	3,011
Income Support	3,910 <sup>e</sup>	11,874
Housing Benefit	2,860 + 1,615 <sup>g</sup>	11,219
Council Tax Benefit	3,312 + 2,005 <sup>g</sup>	2,484
Family Credit	775 <sup>h</sup>	2,477
Disability Working Allowance	16 <sup>i</sup>	49

**Notes:** Figures are all for GB not UK.

<sup>a</sup> end 1997; <sup>b</sup> December 1998; <sup>c</sup> child benefit plus lone parent benefit; <sup>d</sup> February 1999;

<sup>e</sup> February 1998; <sup>f</sup> March 1998; <sup>g</sup> On IS + not on IS; <sup>h</sup> average for 1998; <sup>i</sup> January 1999.

**Source:** *Social Security Statistics 1999*, Department of Social Security.

<sup>6</sup> Office for National Statistics, *Monthly Digest of Statistics*, March 2001, Table 2.1.

<sup>7</sup> HM Treasury, *Financial Statement and Budget Report March 2000*, HC346, TSO, Tables C7 and C9.

## 1.2 Contributions<sup>8</sup>

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 contribution, the most important in terms of revenue-raising being Class 1, which makes up 97% of the total.

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

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 flat payment which is the equivalent of employee Class 1 contributions. Low self-employment income is exempt. The equivalent of the employer contribution is Class 4 contributions. These are payable on income between a lower and upper profits 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 earnings. (The same maximum applies to people with earnings from several employments.)

Employees who are contracted out of *SERPS* pay a lower rate of contribution. 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 allows them to pay no Class 2 (if self-employed) or a low rate of Class 1 (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.

## 1.3 Personal direct taxes

Table 1.2 shows the composition of UK taxes, including NICs, in 1998/9 as a percentage of GDP. The personal direct taxes that potentially come within the remit of EUROMOD are, in addition to NICs, income tax, Council Tax, and the three capital taxes, stamp duties, capital

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<sup>8</sup> For more detailed information see Tolley’s *Social Security and State Benefits Handbook 1998-99*, Tolley’s: Croydon.

gains tax and inheritance tax. These together make up about half of all UK tax revenues. They are considered in turn below.

**Table 1.2 UK taxes and contributions, 1998/9**

	£ billion	% of GDP	% of total
Income tax (net of credits)	86.4	10.1	27.2
National Insurance contributions	55.1	6.4	17.4
Value Added Tax	52.3	6.1	16.5
Customs and Excise duties and levies	46.4	5.4	14.6
Corporation tax	30.0	3.5	9.4
Business rates	15.3	1.8	4.8
Council Tax	12.1	1.4	3.8
Stamp duties	4.6	0.5	1.4
Capital gains tax	1.8	0.2	0.6
Inheritance tax	1.8	0.2	0.6
Other taxes and royalties	11.7	1.4	3.7
<b>Total net taxes and contributions</b>	<b>317.7</b>	<b>37.1</b>	<b>100.0</b>

**Source:** HM Treasury, *Financial Statement and Budget Report March 2000*, HC346, TSO, Tables C7 and C9.

### 1.3.a 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 and, in 1998, non-refundable tax credits for married couples (“Married couples allowance - MCA”) and lone parents (“Additional personal allowance”). Allowances and the MCA are higher for people aged over 65 and higher still for those aged over 75 (“Age allowance”), although the 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). The value of the main tax expenditures and structural reliefs is shown in Table 1.3. (Note that these figures are provided to give a flavour of the magnitudes involved. Interaction between income tax and corporation tax makes exact calculations for income tax alone difficult. In addition, the incidence of some of the reliefs is not clear-cut.)

The total estimated cost of reliefs and tax expenditures is £59 billion, which can be compared with revenue of £86 billion.

The 1998 tax schedule consists of three rate bands: a narrow first band of 20%, a wide “standard rate” band of 23% and a higher rate of 40%, affecting less than a tenth of income taxpayers. Income from financial capital that was not tax-exempt was taxed at 20% if the taxpayer’s marginal rate on that income was within the standard rate band. Table 1.4 shows the total tax liability and the number of taxpayers with marginal rates in each band.

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.

**Table 1.3 Costs of principal tax expenditures and structural reliefs, income tax, 1998-99**

	£ million
Personal allowance	31,200
Married couples allowance	2,900
Age related allowance	1,100
Additional personal allowance	220
Exemption of tax-free social security benefits	2,140
Other reliefs and exemptions	19,250
including <i>Contributions to approved pension schemes</i>	<i>11,400</i>
<i>First tranche of redundancy pay</i>	<i>1,100</i>
<i>Profit-related pay</i>	<i>1,500</i>
Tax credits	2,020
including <i>Mortgage interest tax relief</i>	<i>1,900</i>
<b>TOTAL</b>	<b>58,830</b>

Source: HM Treasury, 1999, *Tax Ready Reckoner and Tax Reliefs*, Table 7.

**Table 1.4 Number of income taxpayers by marginal rate and proportion of total tax, 1998/9**

Band	Taxpayers with marginal rate in band (thousands)	% of total income tax
Lower (20%)	7,300	3.6
Standard (23%)	17,300	46.5
Higher (40%)	2,300	49.1
<b>Total</b>	<b>26,900</b>	<b>100.0</b>

Source: Calculated from Board of Inland Revenue, *Inland Revenue Statistics 2000*, Table 3.4

### 1.3.b Council Tax

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 (ie different in England, Scotland and Wales but the same within them) bands according to property value. The tax in each band is some multiple of the tax in the 4<sup>th</sup> 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).<sup>9</sup>

### 1.3.c Capital Taxes<sup>10</sup>

**Capital gains tax** is levied on gains arising from the disposal of assets by individuals, representatives and trustees. There is an allowance (£7,100 in 1998/9) on which an individual's capital gain is exempt from tax (the allowance for trusts is lower). Since March 1998 there has been a taper system which reduces the proportion of the gain that is chargeable to tax, the longer the asset has been owned. In 1996/7 there were 108,000 people paying capital gains tax.

**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 in 1998/9 no tax was charged on estates worth less than £223,000. Certain assets such as farms and small businesses are eligible for relief. Transfers to spouses and charities are exempt.

**Stamp duty** is 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. (In 1998/9 the rate was zero on properties below of £60,000; 1% on the full value of property up to £250,000; 2% on property between £250,000 and £500,000 and 3% on properties selling for more than that.)

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<sup>9</sup> See Hills J and H Sutherland, 1991, 'The Proposed Council Tax', *Fiscal Studies*, November.

<sup>10</sup> This section draws heavily on Chennells L., A. Dilnot and N. Roback "A Survey of the UK Tax System", Institute for Fiscal Studies, <http://www.ifs.org.uk/taxsystem/final1.pdf>.

## 2. Simulation of taxes and benefits in EUROMOD

### 2.1 The scope of EUROMOD

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 classifies each of the main tax-benefit instruments (and some minor ones introduced above) into one of these three groups and provides a brief explanation as to why the instrument is not fully simulated if this is the case.

### 2.2 The order of simulations in the 1998 system

The following table shows the order in which the main elements of the UK system are simulated. This table, and others like it that are extracted from EUROMOD parameter sheets are shaded in grey. This is extracted from the sheet *spine\_uk\_1998*.

Section	Policy	Description	Main output
2.3	<b>EESIC_UK</b>	Employee Social Insurance Contribution	co_gen_eesic
2.4	<b>ERSIC_UK</b>	Employer Social Insurance Contribution	co_gen_ersic
2.5	<b>iben_ue_UK</b>	Job Seekers Allowance (contributory unemployment benefit)	uk_iben_UE
2.6	<b>IT_UK</b>	Income Tax	co_nat_inctax
2.7	<b>SBEN_CB_UK</b>	Child Benefit	uk_sben_CB
2.8	<b>SBEN_FC_UK</b>	Family Credit	uk_sben_FC
2.9.3	<b>SBEN_virt_IS_UK</b>	Preliminary IS used for the nondependent deduction	uk_IS_temp
2.9.2	<b>sben_nondep_ded_UK</b>	Nondependent deduction	uk_sben_nondep_ded
2.9.1	<b>SBEN_IS_UK</b>	Actual Income Support	uk_sben_IS
2.10	<b>sben_hb_UK</b>	Housing benefits	co_sben_hb
2.11.2	<b>sben_ctb_ndd_UK</b>	Council Tax Benefit Nondependent deduction	uk_sben_ctb_nondep_ded
2.11.1	<b>sben_ctb_UK</b>	Council Tax benefit	uk_sben_ctb

The four means-tested benefits, Family Credit (*uk\_sben\_FC*), Income Support (*uk\_sben\_IS*), Housing Benefit (*co\_sben\_hb*) and Council Tax Benefit (*uk\_sben\_ctb*) all depend on income after income tax (*co\_nat\_inctax*) and employee and self-employed contributions (*co\_gen\_eesic*) have been deducted. They are therefore simulated after the simulation of income taxes and contributions. The means-tested benefit income tests also take account of Job Seekers Allowance (JSA - contributory unemployment benefit) (*uk\_iben\_UK*) and (with the exception of Family Credit), Child Benefit (*uk\_sben\_CB*). So these non-means-tested benefits must be simulated first. Housing Benefit and Council Tax Benefit include Family Credit in their means-test and their calculation depends on whether or not Income Support is received. So this determines the order of calculation of means-tested benefits. Income Support, Housing Benefit and Council Tax Benefit entitlements depend on whether there are non-dependent adults living in the household. The definition of non-dependent and the associated deduction (*uk\_sben\_nondep\_ded*, *uk\_sben\_ctb\_nondep\_ded*) are calculated before the calculation of the respective benefits. Since the definition depends on IS receipt by the non-dependent, entitlement to this (*uk\_IS\_temp*) must be calculated first

**Table 2.1 UK tax-benefit instruments and their treatment in EUROMOD**

<b>BENEFITS</b>	<b>Treatment in EUROMOD</b>	<b>Variable name(s)</b>	<b>Why not fully simulated?</b>
Job Seeker's Allowance (contributory)	Partly simulated	ukBENunb uk_iben_ue	No data on contribution history
Incapacity Benefit	Included	ukBENinc	Inadequate data on length of sickness spell and contribution history
Retirement Pension (basic)	Included	ukBENpen	No data on contribution history or retirement date
Widow's Benefit	Included	ukBENwid	No data on deceased husband's contributions or date of widowhood
Maternity Benefit	Included	coMATERY	No data on pregnancy dates, contribution conditions, previous earnings
Child Benefit	Simulated	ukBENchb uk_sben_cb	
Lone Parent Benefit	Simulated	ukBENchb uk_sben_cb	Simulated as part of Child Benefit
Attendance Allowance	Included	ukBENatt	Insufficient information on disability
Disability Living Allowance	Included	ukBENDsc+ ukBENmob	Insufficient information on disability
Severe Disablement Allowance	Included	ukBENsda	Insufficient information on disability
Invalid Care Allowance	Included	ukBENica	Insufficient information on disability
Industrial Injuries Disablement Benefit	Included	ukBENind	Insufficient information on disability
Guardian's Allowance	Excluded	-	Too few cases; no information
War Pension	Included	ukBENwar	Insufficient information on injury
Job Seeker's Allowance (means-tested)	Simulated	ukBENins uk_sben_is	Simulated as part of Income Support
Income Support	Simulated	ukBENins uk_sben_is	
Housing Benefit	Simulated	ukHB co_sben_hb	
Council Tax Benefit	Simulated	ukBENctb uk_sben_ctb	
Family Credit	Simulated	ukBENfcr uk_sben_fc	
Disability Working Allowance	Included	ukBENDwa	Insufficient information on disability; scheme substantially modified since data year
Social Fund	Excluded	-	No data; cannot model local discretion

...continued

.... Table 2.1 continued

<b>TAXES</b>	<b>Treatment in EUROMOD</b>	<b>Variable name(s)</b>	<b>Why not fully simulated?</b>
Income tax	Simulated	co_nat_inctax	Some exemptions and small allowances are ignored.
National Insurance contributions	Simulated	coEESIC co_gen_eesic	Special schemes for small groups are ignored.
Value Added Tax	Simulated <sup>a</sup>	-	
Customs and Excise duties and levies	Most simulated <sup>a</sup>	-	
Corporation tax	Excluded	-	Not a personal tax
Business rates	Excluded	-	Not a personal tax
Council Tax	Included	ukLOCTAX	No data on property value or council tax band; no location information below standard region.
Stamp duties	Excluded	-	No suitable data; small numbers
Capital gains tax	Excluded	-	No suitable data; small numbers
Inheritance tax	Excluded	-	No suitable data; small numbers
Other taxes and royalties	Excluded	-	No suitable data; small numbers
<b>OTHER INCOME COMPONENTS</b>			
Earnings related state pension	Included	ukbenser	Contribution history unknown
Student grants and loans	Included	coEDY	Loans replaced grants since data year; grant information is used.
Statutory Sick Pay	Included	ukBENssp	No data on qualifying conditions
Statutory Maternity Pay	Included	coMATERY	No data on qualifying conditions
Childcare cost benefit/subsidy	Excluded	-	No data
Child Support	Included	coMAINTY	No data on absent parents; system changed since data year; old maintenance payment data used.
Foster allowances	Included	ukFOST	Numbers too small
Training allowances	Included	ukBENtrn	System changed too much to model between data and policy year.

**Notes:** a These taxes are simulated from imputed expenditure data. Documentation is provided in Baldini et al (2001)



There is no interaction between contributions and income tax so these instruments could be simulated in any order. JSA is taxable so must be simulated before income tax. In principle Income Support (IS) is taxable too but a person in receipt of IS all year would have an income too low to pay tax so this possibility is ignored. (Part year recipients may pay tax on their IS but these instances are not captured by the weekly micro-data - see section 3.4.)

Employer contributions (*co\_gen\_ersic*) do not interact with any other instruments and could be calculated at any point.

### 2.3 Employee (and self-employed) Social Insurance Contributions (policy *EESIC\_UK*)

Individuals between the ages 16 (*minage*) and 64 (*maxagm*) (men) or 59 (*maxagf*) (women) are subject to Class 1 contributions (*uk\_eesic\_nic1*) on their gross earnings (*ukNIC1\_il* = *ukNIC1*). Contributions are paid on earnings between a weekly lower limit £64 (*low\_lim*) and upper limit £485 (*top\_lim*). If earnings are less than the lower limit, nothing is paid. Once the lower limit is reached, contributions are charged on all earnings but the rate on earnings below the lower threshold is much lower at 2% (*lfix*). Earnings above the upper limit are ignored. If the person is non-contracted out of the State Earnings Related Pension Scheme the rate is 10% (*UKNIC1\_rt*). If they are contracted out (and are paying contributions into a private scheme) then they pay a lower rate of 8.4% (*UKNIC1\_rt2*). If they are married or divorced women and have opted out, they pay a lower rate 3.85% (*UKNIC1\_rt3*). Which of the three regimes a person contributes under is information provided in the micro-data (*ukOUTPEN*).

In 1998 the upper limit for contracting out and the upper limit for any contributions were the same. An additional parameter is available (*up\_lim*), in 1998 set at the same value as (*top\_lim*) - £485 - which allows the upper limit for all contributions to be raised while retaining a limit at a lower level on reduced rate contracted out contributions. Contributions on earnings between (*up\_lim*) and (*top\_lim*) would be paid at rate (*up\_rate*). This is currently set at 10%.

<i>uk_eesic_nic1</i>	UK_1998	Class 1 National Insurance contributions (employees) - semi-trigger structure
<i>lfix</i>	0.02	rate charged below <i>low_lim</i> if earnings > <i>low_lim</i>
<i>up_lim</i>	485	upper limit to band in which contracting-out is possible
<i>low_lim</i>	64	lower earnings limit
<i>top_lim</i>	485	upper earnings limit - ceiling to contributions
<i>up_rate</i>	0.1	rate charged above <i>up_lim</i>
<i>UKNIC1_rt1</i>	0.1	rate between <i>low_lim</i> and <i>up_lim</i> if not contracted out
<i>UKNIC1_rt2</i>	0.084	rate between <i>low_lim</i> and <i>up_lim</i> if contracted out
<i>UKNIC1_rt3</i>	0.0385	rate between <i>low_lim</i> and <i>up_lim</i> if qualifying married woman
<i>minage</i>	16	min age 16
<i>maxagm</i>	65	max age for men 64
<i>maxagf</i>	60	max age for women 59
<i>ukNIC1_il</i>	<i>ukNIC1</i>	

People with self-employment income are subject to Class 2 (*uk\_eesic\_nic2*) and Class 4 (*uk\_eesic\_nic4*) contributions. In both cases age limits apply (in 1998 they are the same as those for Class 1). Class 2 is a flat payment £6.35 (*pay*) paid in each week that a person has self-employment income (*ukNIC2\_il* = *ukNIC2*) over £69.04 (*lim*).

<b>uk_eesic_nic2</b>	<b>UK_1998</b>	<b>Class 2 National Insurance contributions (self-employed)</b>
lim	69.04	threshold below which no payment
pay	6.35	flat payment
minage	16	min age 16
maxagm	65	max age for men 64
maxagf	60	max age for women 59
ukNIC2_il	ukNIC2	

Class 4 contributions are paid on self-employment income ( $ukNIC4\_il = ukNIC4$ ) at a rate of 6% ( $UKNIC4\_rt1$ ) between a lower limit £140.58 ( $low\_lim$ ) and an upper limit £485 ( $top\_lim$ ). No contributions are paid on income below the lower limit and income above the upper limit is ignored. The limits apply to annual income but in EUROMOD are modelled on a monthly basis (and specified on a weekly basis).

There is an annual maximum payment for people who are liable for a combination of Class 1, 2 and 4 contributions. This is equal to the maximum Class 1 contribution. It is programmed to apply automatically and cannot, as things stand, be switched off using parameters. (This will be changed in future versions of EUROMOD. In the current version, users should be aware that policy changes which increase Class 4 liabilities will not necessarily have their full impact on individuals who have employment as well as self-employment income.)

<b>uk_eesic_nic4</b>	<b>UK_1998</b>	<b>Class 4 National Insurance contributions (self-employed) slice structure</b>
low_lim	140.58	threshold below which no payment
top_lim	485	upper limit (ceiling)
UKNIC4_rt1	0.06	rate between low_lim and top_lim
minage	16	min age 16
maxagm	65	max age for men 64
maxagf	60	max age for women 59
ukNIC4_il	ukNIC4	

## 2.4 Employer Social Insurance Contributions (policy ERSIC\_UK)

The age condition for employer contributions (age 16+ with no upper limits) are set using  $co\_SBEN\_Elig$ . If earnings ( $Le\_incl\_il = ukNIC1$ ) are less than the lower earnings limit ( $Le\_incl\_lt$ ) then contributions are not calculated. (Note that the earnings definition is the same for employee and employer contributions.)

Using ( $Base\_IL = ukNIC1$ ) as the earnings definition (in 1998 it is the same as employee contributions), employer contributions are calculated using ( $co\_ts\_schedule$ ) which allows for a “trigger” rather than the more usual “slice” schedule. There are a number of bands ( $nbands$ ) and if earnings exceed a band upper threshold (e.g.  $band2$ ), all earnings are charged at the next band rate (e.g.  $rate3$ ). There is no upper limit.

<b>co_ts_schedule</b>	<b>UK_1998</b>	<b>Common Multi Purpose Trigger Slice Schedule</b>
must_be_elig	1	this module is only run for eligible units
nbands	5	trigger structure
rate1	0	
rate2	0.03	
rate3	0.05	
rate4	0.07	
rate5	0.1	
band1	64	rate1 charged on earnings if they are < band1
band2	110	rate2 charged on earnings if they are < band2

band3	155	
band4	210	rate5 charged on earnings if they are >band5
Base_IL	ukNIC1	

For those who are contracted out of the State Earnings Related Pension Scheme (indicated by micro-data variable `ukOUTPEN`) the rates charged are reduced by 3 percentage points (`cored`) on earnings between the lower limit (`low_lim`) and an upper limit (`up_lim`).

<code>uk_ersic_contract_out</code>	UK_1998	contracted out reduction in rate
<code>cored</code>	0.03	rate reduced by <code>cored</code> between <code>low_lim</code> and <code>up_lim</code>
<code>low_lim</code>	64	
<code>up_lim</code>	485	
Base_IL	ukNIC1	

For illustrative purposes Table 2.2 shows the employer contributions due at various levels of earnings in 1998.

**Table 2.2 Employer contributions by earnings level, 1998**  
£/week

Earnings	Not contracted out	Contracted out
63	0.00	0.00
64	1.92	1.92
110	5.50	4.12
155	10.85	8.12
210	21.00	16.62
485	48.50	35.87
1000	100.00	87.37

## 2.5 Job Seekers Allowance (contributory unemployment benefit) (policy `IBEN_UE_UK`)

The age conditions for receipt of contributory JSA (aged under 60 if a woman and under 65 if a man) are set using (`co_SBEN_Elig`).

The other main condition that is used is that the micro-data show current unemployment benefit receipt. (Unemployment benefit was the name given to the equivalent insurance benefit in the data year.) This substitutes for modelling contribution conditions. This is done by setting (`benelig=1`) and defining (`benelig_name = ukBENunb`) which is recorded benefit receipt in the micro-data.

A third condition is that hours of work should be less than some maximum (`ge_hours_lt`) – 16 in 1998.

The basic weekly amount of JSA is calculated using (`co_SBEN_calc`). 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.

<b>co_SBEN_Calc</b>	<b>UK_1998</b>
SingPay	30.3
wdrl_rt	1
rep_rt	0
rep_prev_inc_il	0
SBEN_amt_max	0
SBEN_max	0
SBEN_amt_min	0
SBEN_min	0
cohab=spouse	1
es_age1	1
es_age1_min	0
es_age1_max	17
es_age2	1.3151815
es_age2_min	18
es_age2_max	24
es_age3	1.6617162
es_age3_min	25
es_age3_max	130

There are two ways in which the basic benefit can be reduced. First, benefit is reduced £ for £ with any earnings (`disregard_il = earns`) after the first disregarded amount of £5 (`disregard_amt`). Then any occupational or private pension (`disregard_il=pen`) over £50 (`disregard_amt`) causes the benefit to be reduced £ for £.

<b>co_SBEN_Disregard</b>	<b>UK_1998</b>
ge_disregard	0
le_disregard	0
disregard_amt	5
disregard_il	earns
cohab=spouse	1
es_htu	1
TAX_UNIT	individual
<b>co_SBEN_Means</b>	
Means_inc_il	earns
TAX_UNIT	individual
<b>co_SBEN_Disregard</b>	
ge_disregard	0
le_disregard	0
disregard_amt	50
disregard_il	pen
cohab=spouse	1
es_htu	1
TAX_UNIT	individual

Contributory JSA is payable for 6 months only. EUROMOD normally does not take account of this, but in calculating the equivalent of annual income, it is possible to adjust the amount using (`co_multiply_output`) with (`factor =0.5`). `SWITCH` is set to zero for most applications.

<b>co_multiply_output</b>	<b>UK_1998</b>
factor	0.5
TAX_UNIT	individual
SWITCH	0

## 2.6 Income Tax (Policy *IT\_UK*)

The income tax schedule (*co\_it\_schedule*) consists of 3 bands (*nbands*) and is applied at the individual level to a tax base defined by ( $\text{TaxableY}_{il} = \text{TaxBase}$ ).

<i>co_it_schedule</i>	UK_1998	
<i>nbands</i>	3	number of bands
<i>tax_band1</i>	4300	upper limit of first band
<i>tax_band2</i>	27100	upper limit of second band
<i>tax_rate1</i>	0.2	
<i>tax_rate2</i>	0.23	
<i>tax_rate3</i>	0.4	
<i>TaxableY_il</i>	TaxBase	
<i>TAX_UNIT</i>	individual	

Investment income ( $\text{red\_rate}_{il} = \text{invrent}$ ) which falls within the standard rate band is taxed at the reduced rate of 20% (*red\_rate*). The “standard rate” is defined by setting (*red\_rateno*) to the relevant band number (=1 in 1998) with the lowest band numbered zero. (Note that rate only applies in the relevant band, not to bands below it regardless of the level of the rates in relation to the special rate.) It is assumed that investment income forms the “top slice” of taxable income.

<i>uk_it_inctax_red</i>	UK_1998	
<i>red_rate</i>	0.2	rate on investment income ( $\text{TaxableY}_{il}$ )
<i>red_rateno</i>	1	
<i>red_rate_il</i>	invrent	
<i>TaxableY_il</i>	TaxBase	
<i>TAX_UNIT</i>	individual	
<i>SWITCH</i>	1	

The tax schedule for 1998 is shown in Table 2.3.

**Table 2.3 Income tax schedule in 1998**

Upper limit of total taxable income after personal tax- free allowance and other exemptions (£/year)	Marginal rate on taxable	
	earned income (%)	investment income (%)
4,300	20	20
27,100	23	20
> 27,100	40	40

The main personal allowances and credits are summarised in Table 2.4.

**Table 2.4 Personal tax allowances and credits in 1998**

Allowance/credit	Amount per year £	Value £/year
Single personal allowance all individuals ( <code>co_it_main_tfa</code> )	£4,195	Depends on marginal rate of tax: min 0; max £1,678
Age allowance Age 65-74 ( <code>uk_age_it_tfa1</code> )	£5,410 reduced to £4,195 (50% of income over £16,200)	Depends on taxable income and marginal rate: min 0; max £1,678
Age allowance Age 65-74 ( <code>uk_age_it_tfa2</code> )	£5,600 reduced to £4,195 (50% of income over £16,200)	Depends on taxable income and marginal rate: min 0; max £1,678
Married couples “allowance” Age <65 ( <code>uk_it_mc_tcred</code> )	£1,900	Up to £285 per couple
Additional personal “allowance” (lone parents) ( <code>uk_it_lp_tcred</code> )	£1,900	Up to £285
Married couples age allowance: Age 65-74 ( <code>uk_marr_age_it_tfa1</code> )	£3,305 reduced to £1,900 (50% of income over £16,200, less any reduction to personal age allowance)	Up to £495.75 per couple
Married couples age allowance: Age 75+ ( <code>uk_marr_age_it_tfa2</code> )	£3,345 reduced to £1,900 (50% of income over £16,200, less any reduction to personal age allowance)	Up to £501.75 per couple

The basic tax free- personal allowance is defined in (`co_it_main_tfa`). It (`tfa`) applies to people of working age and younger. Higher allowances apply to people in two older age groups, defined in (`uk_age_it_tfa1`) and (`uk_age_it_tfa2`). The additional amounts are tapered away (`ageallow_taper`) with income (`TaxableY_il`) over a limit (`ageallow_inc`). Once the allowance has been reduced to the basic level (`ageallow`) there is no more reduction.

<code>co_it_main_tfa</code>	<b>UK_1998</b>	
<code>tfa</code>	4195	allowance
<code>age_limit1</code>	0	lower age limit
<code>age_limit2</code>	64	upper age limit
<code>TAX_UNIT</code>	individual	
<code>uk_age_it_tfa1</code>	<b>UK_1998</b>	
<code>age_limit1</code>	65	lower age limit
<code>age_limit2</code>	74	upper age limit
<code>ageallow_inc</code>	16200	income limit ( <code>TaxableY_il</code> ) above which age-related addition to personal allowance is tapered away
<code>ageallow_taper</code>	0.5	taper
<code>ageallow</code>	4195	regular personal allowance
<code>ageallow_limit</code>	5410	maximum age-related allowance
<code>TaxableY_il</code>	IT_TaxableY	
<code>TAX_UNIT</code>	individual	
<code>uk_age_it_tfa2</code>	<b>UK_1998</b>	
<code>age_limit1</code>	75	lower age limit

age_limit2	120	upper age limit
ageallow_inc	16200	income limit (TaxableY_il) above which age-related addition to personal allowance is tapered away
ageallow_taper	0.5	taper
ageallow	4195	regular personal allowance
ageallow_limit	5600	maximum age-related allowance
TaxableY_il	IT_TaxableY	
TAX_UNIT	individual	

Married couples in 1998 received a tax credit which is defined in (`uk_it_mc_tcred`). The value of the credit is set in terms of an annual amount (`mageallow`) and a rate which is applied to it (`tc_rate`). The resulting amount (£285 in 1998) is deducted from final taxable income, but any excess is not refunded. The credit could be split by couples or could be set against the tax of one of them (usually the husband, because this credit replaced the “married man’s allowance” which existed until 1990 under joint taxation.) Any un-used amount could be transferred to the other spouse.

(Note that `TaxableY_il` is redundant in `uk_it_mc_tcred` and will be removed in future versions.)

<code>uk_it_mc_tcred</code>	UK_1998	
age_limit1	0	
age_limit2	64	upper age limit
mageallow	1900	Credit
tc_rate	0.15	rate at which credit allowed
TaxableY_il	IT_TaxableY	
TAX_UNIT	marrcouple	

A similar credit (`uk_it_lp_tcred`) existed for lone parents who were not legally married (defined by `TAX_UNIT = lp`).

<code>uk_it_lp_tcred</code>	UK_1998	
allow	1900	credit
tc_rate	0.15	rate at which credit allowed
TAX_UNIT	lp	

The married couple’s credit is enhanced for couples where one or both were aged of 65 or more (and further enhanced if aged 75+). These married age allowance additions are defined in (`uk_marr_age_it_tfa1`) and (`uk_marr_age_it_tfa2`) and work similarly to the personal age allowance. The higher allowance (`mageallow_limit`) is tapered away (`ageallow_taper`) according to the individual’s taxable income in excess of (`ageallow_inc`) until it is reduced to the level of the ordinary allowance (`mageallow`). However, account is taken of reductions in the personal age allowance (`ageallow_limit`) due to this excess of income so that the income at which the extra allowance is exhausted is higher for married people than for single people. The married age allowance tends to be claimed by the husband, but unused parts can be transferred to the wife.

<code>uk_marr_age_it_tfa1</code>	UK_1998	
age_limit1	65	lower age limit
age_limit2	74	upper age limit
ageallow_inc	16200	income limit (TaxableY_il) above which age-related additions to personal allowance + married credit is tapered away
ageallow_taper	0.5	taper
ageallow	4195	regular personal allowance

ageallow_limit	5410	maximum age-related allowance
mageallow	1900	regular married tax credit
mageallow_limit	3305	maximum age-related married credit
tc_rate	0.15	rate at which credit allowed
TaxableY_il	IT_TaxableY	
TAX_UNIT	marrcouple	
<b>uk_marr_age_it_tfa2</b>		
age_limit1	75	lower age limit
age_limit2	120	upper age limit
ageallow_inc	16200	income limit (TaxableY_il) above which age-related additions to personal allowance + married credit is tapered away
ageallow_taper	0.5	taper
ageallow	4195	regular personal allowance
ageallow_limit	5600	maximum age-related allowance
mageallow	1900	regular married tax credit
mageallow_limit	3345	maximum age-related married credit
tc_rate	0.15	rate at which credit allowed
TaxableY_il	IT_TaxableY	
TAX_UNIT	marrcouple	

Tax relief on mortgage interest payments is defined in (*uk\_it\_miras\_tcred*). In 1998 maximum tax annual relief was 10% (*miras\_rate*) of the interest on capital of £30,000 (*miras\_limit*). This relief was in practice allowed at source, as a reduction in mortgage interest payment and did not depend on the tax status or taxable income of the person with the mortgage. In EUROMOD, tax relief is deducted from the tax of the householder as a refundable tax credit. Thus people paying mortgage interest with no tax liabilities will have negative values for final income tax.

(Note that the same calculations are repeated in **SBEN\_IS\_UK**. If the rules for MIRAS are changed here, they should also be changed using the parameters in IS. This calculation will be made common in future versions of EUROMOD.)

<b>uk_it_miras_tcred</b>	<b>UK 1998</b>	
int_rate1	0.0763	annual interest rate in data year
int_rate2	0.0838	annual interest rate in policy year
miras_limit	30000	max capital on which relief allowed
miras_rate	0.1	rate at which relief allowed
TAX_UNIT	household	

## 2.7 Child Benefit (Policy *SBEN\_CB\_UK*)

Child benefit is paid to all families with dependent children (*TAX\_UNIT* = *SBEN\_family*) in (*co\_SBEN\_Elig*). There is flat rate amount per child of £9.30 per week (*SingPay*) and an addition for the first or only child of £2.15 (*es\_ch\_parity1*). There is also an addition for lone parent families of £6.95 per family (*es\_ch\_parity1*).

<b>co_SBEN_Calc</b>	<b>UK 1998</b>	
SingPay	9.3	amount per child
wdr1_rt	0	
rep_rt	0	
rep_prev_inc_il	0	
SBEN_amt_max	0	
SBEN_max	0	
SBEN_amt_min	0	



SBEN_min	0	
es_ch_parity1	1.2311828	extra for first child
es_ch_parity1_lt	1	
es_ch_parity2	1	
es_ch_parity2_lt	20	
es_ch_parity1	0.6075269	extra per lone parent family
TAX_UNIT	SBEN_family	

## 2.8 Family Credit (Policy *SBEN\_fc\_UK*)

Families are eligible for Family Credit if they have at least one dependent child and at least one parent is in employment or self-employment for 16 hours or more a week. These conditions are set using (*co\_SBEN\_Elig*) and with (*TAX\_UNIT = SBEN\_family*). A further condition is that the family should have less than £8000 worth of capital. The capital rule is set using (*uk\_sben\_capital\_test*) with capital defined as (*capital\_il = SBEN\_capital*) and (*gemax\_capital\_lt*) as the capital cut-off.

<i>uk_sben_capital_test</i>	UK 1998	
<i>capital_il</i>	SBEN_capital	
<i>gemax_capital_lt</i>	8000	capital limit - capital over this disqualifies family
TAX_UNIT	SBEN_family	

Family Credit entitlement is calculated using the formula:

$$FC = MAX - (INCOME - THRESHOLD) * TAPER$$

Maximum entitlement to Family Credit (MAX) depends on the number and ages of children (not on the number of parents). This is calculated in (*co\_SBEN\_Calc*). An extra amount of £10.80 (*es\_ge\_hrs*) is added if one parent works 30 (*es\_ge\_hrs\_lt*) or more hours per week. This maximum amount is reduced at a rate of 70% (*wdrl\_rt*) for any income that the family has over the “starting amount”. EUROMOD treats this starting amount (£79 per week in 1998/9) as a disregard using (*co\_SBEN\_Disregard*).

<i>co_SBEN_Calc</i>	UK 1998	
SingPay	48.8	max amount for family, before adding child amounts
<i>wdrl_rt</i>	0.7	withdrawal taper on incomes above disregarded amount
<i>rep_rt</i>	0	
<i>rep_prev_inc_il</i>	0	
<i>SBEN_amt_max</i>	0	
<i>SBEN_max</i>	0	
<i>SBEN_amt_min</i>	0.5	min payment
<i>SBEN_min</i>	1	
<i>cohab=spouse</i>	1	
<i>es_ch_age1</i>	0.25307377	max addition per child in age band 1
<i>es_ch_age2</i>	0.419057377	max addition per child in age band 2
<i>es_ch_age3</i>	0.520491803	max addition per child in age band 3
<i>es_ch_age4</i>	0.728483607	max addition per child in age band 4
<i>es_family</i>	1	
<i>es_ge_hrs</i>	0.221311475	max addition for working at least <i>es_ge_hrs_lt</i>
<i>es_ge_hrs_lt</i>	30	qualifying min hours for extra payment
<i>es_ch_age1_min</i>	0	
<i>es_ch_age1_max</i>	10	

es_ch_age2_min		11	
es_ch_age2_max		15	
es_ch_age3_min		16	
es_ch_age3_max		17	
es_ch_age4_min		18	
es_ch_age4_max		18	
TAX_UNIT	SBEN_family		
<b>co_SBEN_Disregard</b>	<b>UK_1998</b>		
ge_disregard		0	
le_disregard		0	
disregard_amt		79	income at or below which maximum is paid
disregard_il	fc		
es_htu		1	
TAX_UNIT	SBEN_family		

In assessing family income, all main sources are included and income tax and contributions are deducted ( $Means\_inc\_il = fc\_means$ ) in (**co\_SBEN\_Means**). The assessment is based on weekly income, averaged over a few weeks. The income assessment calculation is the same as for Income Support (see section 2.9.1) except that Child Benefit, Maternity Benefit and Statutory Maternity Pay are not included. The first parts of maintenance payments (£15) ( $fc\_maindis$ ) and war pension (£10) ( $fc\_wardis$ ) are disregarded in (**uk\_sben\_fc\_disregard**); and income from capital is imputed using (**co\_SBEN\_CapMeans**). The first £3000 of capital is disregarded using (**co\_SBEN\_CapDisregard**). Then a tariff income of £1 per week is imputed for every £250 (or part) of capital. Thus a family with capital of £5001 would have £9 imputed and added to income. In EUROMOD this is done using an effective interest rate on capital above the disregard of 0.04% ( $CapitalRate1$ ) in (**co\_SBEN\_CapMeans**) which gives approximately but not exactly the same result (in fact, £8 in this example).

<b>co_SBEN_CapDisregard</b>	<b>UK_1998</b>		
ge_disregard		0	
le_disregard		0	
disregard_amt		3000	
disregard_il	sben_capital		
es_htu		1	
TAX_UNIT	SBEN_family		
<b>co_SBEN_CapMeans</b>	<b>UK_1998</b>		
CapitalThreshold		0	
CapitalRate1		0.004	effective interest rate on capital after disregard
CapitalRate2		0.004	
Addition		0	
Period		0	
capital_il	sben_capital_means		
TAX_UNIT	SBEN_family		

There is a minimum weekly payment of 50p ( $SBEN\_amt\_min$ ) in (**co\_SBEN\_calc**). Family Credit is payable to the main carer of the children, in the first instance. (This is not currently modelled.)

Family Credit is payable for 26 weeks once a claim is granted. It is paid regardless of changes in circumstance, including stopping work, children leaving home or income increasing due to promotion etc. EUROMOD does not take account of this “overhang” in entitlement.

## 2.9 Income Support (and non-contributory Job Seekers Allowance)

Income Support (IS) is the main safety-net social assistance benefit. For those eligible, it is calculated according to the formula:

$$IS = \max (0, (NEEDS - INCOME))$$

NEEDS is the amount of weekly income that is calculated to be necessary for the family unit. For owner-occupiers it includes the cost of ground rent and mortgage interest payments. In cases where there are other people living in the household who are not members of the family unit (“non-dependants”) fixed deductions are made from the additions to NEEDS for mortgage interest. These deductions do not depend on actual contributions to payment mortgage interest, but depend only on the characteristics of the non-dependent. One of these characteristics is receipt of IS. So before the calculation of IS entitlement for the main family unit assumed to be paying housing costs, IS entitlement must be calculated to determine the potential non-dependent deduction level for each person in the household. Section 2.9.2 describes the determination of the non-dependent status and section 2.9.3 describes the calculation of IS receipt for this purpose. The following section, 2.9.1 describes the main calculation of IS.

### 2.9.1 Actual Income Support (Policy *SBEN\_IS\_UK*)

Eligibility is defined by (*co\_SBEN\_Elig*). The unit of entitlement and income assessment is the family unit (*SBEN\_family*) i.e. single people or couples (including co-habitees) with their dependent children. The claimant groups are lone parents, disabled people and pensioners (groups not required to seek work) plus the unemployed. In EUROMOD, entitlement to means-tested Job Seeker’s Allowance for the unemployed is calculated as part of the IS calculations (the rules are the same). Employment or self-employment for 16+ hours per week disqualifies the family.

Families with more than £8000 (*gemax\_capital\_lt*) capital (*capital\_il = SBEN\_capital*) are not eligible for IS.

<i>uk_sben_capital_test</i>	UK_1998	
<i>capital_il</i>	<i>SBEN_capital</i>	
<i>gemax_capital_lt</i>	8000	capital limit - capital over this disqualifies family
<i>TAX_UNIT</i>	<i>SBEN_family</i>	

Table 2.5 summarises the amounts payable (“applicable amounts”) for each type of individual or family. To give some idea of scale, average full-time gross weekly earnings in April 1998 were £384.50.<sup>11</sup>

<sup>11</sup> *New Earnings Survey 1998*, Part A Table A1

**Table 2.5 Income support applicable amounts June 1998 £/week**

	Single, no children	Lone parent	Couple
<b>Personal Allowances</b>			
Aged under 18	30.30 <sup>b</sup>	30.30	Both: 60.10 One: 79.00
Aged 18-24	39.85	50.35	79.00
Aged 25-	50.35	50.35	79.00
Per child aged 0-10	17.30		
Per child aged 11-15	25.35		
Per child aged 16-19	30.30		
<b>Premiums</b>			
Family with children	-	11.05	
Lone parent family <sup>a</sup>	-	5.70	
Disabled child	-	21.45	
Age 60-74	20.10	-	30.35 <sup>c</sup>
Age 75-79	22.35	-	33.55 <sup>c</sup>
Age 80+	27.20	-	38.90 <sup>c</sup>
Age 60+ and disabled	27.20	-	38.90 <sup>c</sup>
Disability	21.45	21.45	30.60
Severe disability	38.50	38.50	38.50 <sup>d</sup>
Carer	13.65 <sup>e</sup>		

**Notes:** a The additional lone parent premium is only payable to those claiming and qualifying before April 1998.

EUROMOD models the premium as though all lone parents qualify.

b Discretionary in special cases: EUROMOD does not model this.

c Either or both spouses over age threshold. Only one premium may be received.

d Per spouse who qualifies as severely disabled.

e Per person cared for.

Family needs are defined in (`co_sbEN_Calc`) and (`uk_sbEN_is_disab_needs`).

<code>co_sbEN_Calc</code>	<code>UK_1998</code>	
<code>SingPay</code>	50.35	single
<code>wdrl_rt</code>	1	Withdrawal Rate = 100%
<code>cohab=spouse</code>	1	Cohabiting couples are treated as a couple
<code>es_ch_age1_min</code>	0	
<code>es_ch_age1_max</code>	10	
<code>es_ch_age1</code>	0.3435948	children 0-10
<code>es_ch_age2_min</code>	11	
<code>es_ch_age2_max</code>	15	
<code>es_ch_age2</code>	0.5034757	children 11-15
<code>es_ch_age3_min</code>	16	
<code>es_ch_age3_max</code>	17	
<code>es_ch_age3</code>	0.6017875	children 16-17
<code>es_ch_age4_min</code>	18	

es_ch_age4_max	18	
es_ch_age4	0.6017875	children 18
es_both_age1	1.1936445	couple if both aged under 18 (but at least 16)
es_both_age1_min	16	NB: currently people under 18 are not eligible in the model
es_both_age1_max	17	
es_couple_age1	1.5690169	couple if one or both aged over 18
es_couple_age1_oldmin	18	
es_couple_age1_oldmax	200	
es_couple_age1_youngmin	16	
es_couple_age1_youngmax	200	
es_AdNoPartner_age1	0.7914598	single aged 18-24
es_AdNoPartner_age1_min	18	
es_AdNoPartner_age1_max	24	
es_AdNoPartner_age2	1	single aged 25+
es_AdNoPartner_age2_min	25	
es_AdNoPartner_age2_max	200	
es_ch_parity1	0.2194638	family premium
es_ch_parity1_lt	1	
es_lp	0.0933466	lone parent premium
es_lp_age1	0.2085402	This is because lone parents get a higher amount when aged 18-24 than non lone parents
es_lp_age1_min	18	
es_lp_age1_max	24	
es_lp_age2	0.6017875	This is because lone parents can get income support aged under 18
es_lp_age2_min	0	
es_lp_age2_max	17	
es_need1	1	
es_need1_tu	SBEN_family	
es_need1_il	mortint	
es_need2	1	
es_need2_tu	SBEN_family	
es_need2_il	needs2	
TAX_UNIT	SBEN_family	

Disability is defined according to receipt of certain disability benefits in (`uk_sben_is_disab_needs`) using (`disaby1_il = is_disaby1`). These are: Attendance Allowance, Disability Living Allowance, Incapacity Benefit, Severe Disablement Allowance and Industrial Injuries Disablement Benefit

In addition, mortgage interest is added to needs in (`co_sben_calc`). Since mortgage tax relief is deducted at source this must also be deducted from the mortgage interest variable that enters the IS calculation. It is calculated using (`uk_sben_is_miras`) which is the same as (`uk_it_miras_tcred`) in (*POLIT\_UK*).

<code>uk_sben_is_miras</code>	UK_1998	
int_rate1	0.0763	annual interest rate in data year
int_rate2	0.0838	annual interest rate in policy year
miras_limit	30000	max capital on which relief allowed
miras_rate	0.1	rate at which relief allowed
TAX_UNIT	household	

One claim for IS is made per family, and entitlement depends on the income of the whole family unit. The income of other people in the household is not taken into account except via the non-dependent deduction (see section 2.9.2). Income is defined by (`Means_inc_il =`

is\_means) in (co\_SBEN\_Means). It includes gross income from employment and self-employment and all other main current income sources **except** investment income (see below) and certain benefits (Housing Benefit and Council Tax Benefit, Attendance Allowance and Disability Living Allowance); half the value of private pension contributions and all of employee and self employed contributions and income tax are deducted.

Some earnings (disregard\_il = earns) are disregarded in (uk\_sbem\_is\_disregard): £15 for a lone parent (is\_erndis1); £15 for a disabled person (is\_erndis2) where disability is signalled by receipt of certain benefits (see above on entitlement to disability premia) within the family unit (disab\_il = disab\_is); £10 for couples not qualifying on disability grounds and £5 for others. In addition, small amounts of war pension and maintenance payments are disregarded in the same way as for Family Credit (see section 2.8) using (uk\_sbem\_fc\_disregard).

uk_sbem_is_disregard		
is_erndis1		10 earnings disregard for a lone parent
is_erndis2		15 earnings disregard for disabled person
is_erndis3		0 earnings disregard for a couple
is_erndis4		5 earnings disregard for single person and each person in couple
disregard_il	earns	
disab_il	disab_is	INCOME LIST OF DISABILITY INCOMES
es_htu		1
TAX_UNIT	SBEN_family	

Income from investment income is not included directly in the IS family income assessment. Instead, a tariff income is calculated on financial capital (disregard\_il = sbem\_capital) between £3000 (disregard\_amt) and the upper threshold £8000 (gemax\_capital\_lt). This works in exactly the same way as the tariff income calculation in Family Credit (see section 2.8).

## 2.9.2 Income Support non-dependent deductions (Policy *sbem\_nondep\_ded\_UK*)

Deductions are made from the housing cost element of the Income Support Applicable Amount (“needs”) if there are non-dependent adults in the household in addition to the householder’s family unit. The “householder” in the UK is the person responsible for the rent or mortgage interest. In the UK data they are the first person in the household, not necessarily the oldest or highest income person. (In the case of couples the householder is generally assumed to be the man.) The size of the deduction depends on the type of non-dependent. These types are defined in (uk\_sbem\_nondep\_ded). No deduction is made where the person is aged under 18 (hb\_ndd\_minag) or where they are aged under 25 (hb\_ndd\_isag) and themselves in receipt of Income Support (IS). To establish this latter condition, IS must be simulated for each non-dependent. (See section 2.9.3.). Other exemptions from deduction apply when the person is a full-time student, where they are blind, or where they are in receipt of Attendance Allowance or the middle or higher rate of the care component of Disability Allowance. None of these cases are modelled. (Note that the first and third of these will be modelled in future versions; the second is not possible because blindness is not identified in the FES data.)

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):

Not in work, or in work and with gross income less than £78 per week (hb_ndd_inc1)	£7 (ndd_ded3)
Gross income £78 up to £116 (hb_ndd_inc1, hb_ndd_inc2)	£16 (ndd_ded1a)
Gross income £116 up to £152 (hb_ndd_inc2, hb_ndd_inc3)	£22 (ndd_ded1b)
Gross income £152 up to £200 (hb_ndd_inc3, hb_ndd_inc4)	£36 (ndd_ded1c)
Gross income £200 up to £250 (hb_ndd_inc4, hb_ndd_inc5)	£41 (ndd_ded1d)
Gross income £250 or more (hb_ndd_inc5)	£45 (ndd_ded1e)

“Work” means full time work for at least 16 hours (hb\_ndd\_hrs) and gross income is defined by (non\_dep\_il = non\_dep) which is similar to the income definition used for IS assessment but is before the deduction of income tax and contributions.

<b>uk_sben_nondep_ded</b>		
first_cond	0	
hb_ndd_minag	18	min age to count as a non-dependent
hb_ndd_hrs	16	min work hours to count as full-time
hb_ndd_inc1	78	for non-deps in full-time work: individual gross income threshold - above this deduction ded1a is made
hb_ndd_inc2	116	for non-deps in full-time work: individual gross income threshold - above this deduction ded1b is made
hb_ndd_inc3	152	for non-deps in full-time work: individual gross income threshold - above this deduction ded1c is made
hb_ndd_inc4	200	for non-deps in full-time work: individual gross income threshold - above this deduction ded1d is made
hb_ndd_inc5	250	for non-deps in full-time work: individual gross income threshold - above this deduction ded1e is made
ndd_ded1a	16	deductions for those in full-time work
ndd_ded1b	22	deductions for those in full-time work
ndd_ded1c	36	deductions for those in full-time work
ndd_ded1d	41	deductions for those in full-time work
ndd_ded1e	45	deductions for those in full-time work
ndd_ded2	7	deduction for person on IS above age ndd_isag
ndd_ded3	7	deductions for those not in work, or in work and with gross income less than hb_ndd_inc1 per week
hb_ndd_isag	25	minimum age for IS recipient to count as non-dependent
non_dep_il	Non_dep	
TAX_UNIT	SBEN_family	

### 2.9.3 Preliminary IS used for the nondependent deduction (Policy *SBEN\_virt\_IS\_UK*)

This policy module calculates IS entitlement for all family units (TAX\_UNIT = SBEN\_family) in the household except the householder-unit. It does so in exactly the same way as in the actual IS calculation (see section 2.9.1) except that the addition of housing needs to the applicable amount is ignored. (By definition, non-dependants do not have these needs.)

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).

## 2.10 Housing benefit (Policy *SBEN\_hb\_uk*)

Housing benefit (HB) covers or contributes to the cost of rent for low income families. There are no conditions regarding working hours: the benefit covers those in work, pensioners, the unemployed, the disabled and the unoccupied. It is assumed that the householder-family pays the rent and claims the benefit.

For families in receipt of Income Support (see section 2.9) housing benefit covers 100% of rent, less non-dependent deductions. These non-dependent deductions are the same as those operating in Income Support (IS) for housing needs (see section 2.9.2). For those with higher incomes (or not in receipt of IS for some reason), the amount of rent (less non-dependent deductions) that is covered by the benefit is tapered away at the rate of 65% (*wdr1\_rt*).

A similar disqualification applies in HB as in IS if the family has more than a certain amount of financial capital. In the case of HB the limit is higher: £16,000 (*gemax\_capital\_lt*).

The income assessment that is used is very similar to that for Income Support (see section 2.9). It also includes Family Credit and Disability Working Allowance in the income assessment, but ignores any addition in these benefits for working 30 or more hours per week. The earnings disregard for lone parents is higher (£25 instead of £15). Since the upper limit on capital (*gemax\_capital\_lt*) is higher, the amount of tariff income that may be included in total means is higher also.

The needs calculation is also the same, with the following exceptions:

- the lone parent premium is higher for HB (an additional £11 instead of £5.70)
- the applicable amount for single people aged 16-24 is £39.85
- the applicable amount for single parents aged under 18 is £39.85
- the applicable amount for couples both aged under 18 is £60.60

However, the parameter sheets are independently specified. When making policy changes, the user should consider whether the IS and HB calculations should remain based on (largely) identical income and needs assessments.

## 2.11 Council Tax benefit (Policy *SBEN\_ctb\_uk*)

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 modelled and are already incorporated in the Council Tax data in the database. These are

- exemptions for certain people including people with some types of disability
- a reduction of 25% if the dwelling is occupied by a single adult

There are really two alternative forms of CTB. One is the HB-type benefit. 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. In most cases the main CTB is worth more, so EUROMOD ignores SAR cases and does not model them.



### 2.11.1 Council Tax Benefit

In the “main” CTB, benefit is calculated in the same way as HB except:

- the taper is 20% (`wdr1_rt`) in (`co_SBEN_Calc`)
- personal allowances are the same as IS (but the lone parent premium is the same as HB)
- although non-dependants are defined in the same way, the amounts of the deductions are different. These are specified in section 2.11.2.

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.

### 2.11.2 Council Tax Benefit non-dependant deductions (Policy `SBEN_CTB_NDD_uk`)

Not in work, or in work and with gross income less than £78 per week ( <code>hb_ndd_inc1</code> )	£2 ( <code>ndd_ded3</code> )
Gross income £78 up to £116 ( <code>hb_ndd_inc1</code> , <code>hb_ndd_inc2</code> )	£2 ( <code>ndd_ded1a</code> )
Gross income £116 up to £152 ( <code>hb_ndd_inc2</code> , <code>hb_ndd_inc3</code> )	£4 ( <code>ndd_ded1b</code> )
Gross income £152 up to £200 ( <code>hb_ndd_inc3</code> , <code>hb_ndd_inc4</code> )	£4 ( <code>ndd_ded1c</code> )
Gross income £200 up to £250 ( <code>hb_ndd_inc4</code> , <code>hb_ndd_inc5</code> )	£5 ( <code>ndd_ded1d</code> )
Gross income £250 or more ( <code>hb_ndd_inc5</code> )	£6 ( <code>ndd_ded1e</code> )

### 3. Data

#### 3.1 General description

The UK database is drawn from the Family Expenditure Survey (FES) for 1995/6. This is a continuous household survey based on a random sample and collected throughout the year (April-March). Its original purpose was to collect expenditure data for weights for the (consumer) retail price index and for National Accounts estimates of consumers' expenditure. Income data are used to identify "Index households" for the retail price index. The survey is now regarded as a multi-purpose source.<sup>12</sup> Data have been used for many official and unofficial income distribution analyses and for tax/benefit modelling.<sup>13</sup> Recently, a new income survey, the Family Resources Survey has started to be used in its place, mainly because of its larger sample size. In the future, this alternative will be considered for EUROMOD.

In Great Britain, the sampling frame is the Post Office's Postcode Address File (PAF), small users sub-file (i.e. addresses receiving fewer than 25 items of mail a day; intended to exclude business addresses), using multi-stage stratified random sample with clustering at the final stage. The sampling fraction is about 1 in 2,100 eligible households. In Northern Ireland, a simple random sample is drawn from the Valuation and Land Agency Lists (these are local government property registers). (Northern Ireland makes up 2% of the achieved sample of UK households.)

An FES household comprises one person living alone or a group of people living at the same address having meals prepared together and with common housekeeping. (This is a slightly more restrictive definition than is common in household surveys. Some people who share dwellings but not meals would be included in the "household" but are excluded from the FES "spending unit".) Resident domestic servants are included. Members of the household are not necessarily related by blood or marriage. A household will consist of one or more benefit units (or "families"). A benefit unit is a single adult or a couple together with any dependent children.

The sample is of households living at private residential addresses. Of these, in Great Britain 96.6% are estimated to be covered by the frame, with no strong biases in the characteristics of households covered by the PAF.<sup>14</sup> The main exclusions are people not living at private addresses such as those in student accommodation, the homeless, those in nursing homes or hospital (for more than 1 month) or other types of residential care, prisoners and people living in military or police institutions.<sup>15</sup> This limitation on the sample will mean that taxes and benefits and other income components will be under-represented to the extent that they are received (or paid) by people living in institutions.

The 1995/6 FES achieved sample is 16586 individuals in 6797 households. The response rate is 66% in Great Britain and 61% in Northern Ireland, calculated as a percentage of private households at the sample addresses. No substitutions are allowed.

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<sup>12</sup> For more information, see Office for National Statistics, 1996 *Family Spending: A report on the 1995/6 Family Expenditure Survey*, TSO:London

<sup>13</sup> For example, (1) Office for National Statistics, 1997, "The Effects of Taxes and Benefits on Household Income 1995-1996", *Economic Trends*, March, TSO:London. (2) Department of Social Security, 1998, *Households Below Average Income, 1979-1996/7*. London: TSO

<sup>14</sup> See Foster (1994) 'The coverage of the PAF as a sampling frame', *Survey Methodology Bulletin*, No. 34.

<sup>15</sup> 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.

## 3.2 Sample quality and weights

### 3.2.1 Non-response

Non-response bias has been studied through information from the decennial Census of Population and Housing on the drawn/eligible FES sample. The most recent study is for FES data in January-June 1991 (Census in April 1991). The main conclusions were that response was lower in Greater London and higher in non-metropolitan areas. Non-response tended to increase with age of the head of household up to age 65. Households with 3 or more adults, or where the head was born outside the UK or was classified to an ethnic minority group were also more likely than other households to be non-responding.

Separate analyses, using a geo-demographic coding system, have indicated similar results. The main problems appear to be lower response rates for older council flat accommodation in inner city areas; and for younger people in houses which have been sub-divided into separate accommodation units or blocks of flats. Non-response by these groups appears to be mainly because of problems in contacting these households; refusal levels appear to be about normal. Response by higher income households seems to be at normal levels.<sup>16</sup>

### 3.2.2 Weights

No “official” weights are provided with 1995/6 FES micro-data. Weights have been specially calculated to adjust for differential response by family type, at the same time as grossing up to population level (58.6 million people in 1995). The Department of Social Security (DSS) provides two sets of population estimates for seventeen different types of family, one set for Great Britain and one for Northern Ireland. These population estimates by family type are divided by the number of FES families of each type. The calculations are shown in Table 3.1. The resulting family unit weights are then combined for multi-family households in such a way that the aggregate results achieved at the family-level of analysis and at the household-level of analysis are identical.<sup>17</sup> The control totals are also used by DSS in their own use of FES data. They make no attempt to adjust for the non-household population.

No attempt is made to adjust for differential non-response in other dimensions than family type. The sample size is too small to support a very detailed exercise of this nature without creating weights that are very large or very small. As things stand, the minimum weight is 2810.3 and the maximum is 5281.8 (the ratio of maximum to minimum is 1.88). The (unweighted) mean is 3679.2.

A comparison can be made of employment status data from FES with LFS data for the same year. This finds that patterns of individuals employed, “ILO unemployed” and inactive in the age groups 16-64/59 are broadly comparable. (E.g. ILO unemployed for 16- 64/59 is 6.3 per cent from LFS and 6.5 per cent from FES.) The proportions of those in employment with second jobs is slightly higher in the FES (5.9 per cent compared with 4.4 per cent from the LFS), though the sample size is smaller and the numbers reported are fairly small.<sup>18</sup>

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<sup>16</sup> This information is taken from Harris G., (1998), “Income Distribution Data for the United Kingdom: Robustness Assessment Report”, Papers and Final Report of the Second Meeting on Household Income Statistics, Voorburg, The Netherlands, March 9-11th, Canberra Group: Expert Group on Household Income Statistics.

<sup>17</sup> The method is described in Gomulka, J. (1994), *Grossing up: a note on calculating household weights from family composition totals*, Microsimulation Unit Research Note MU/RN/4, Department of Applied Economics, University of Cambridge.

<sup>18</sup> See Harris (1998).

**Table 3.1 Calculating weights for family units in 1995/6 FES**

Category	Great Britain			Northern Ireland		
	1. Population estimate ('000 families) Source: DSS	2. FES sample count	Weight col.1/col.2	4. Population estimate ('000 families) Source: DSS	5. FES sample count	Weight col.4/col.5
Couple, 1 child	2072	659	3.1442	60	13	4.6154
Couple, 2 children	2279	751	3.0346	68	9	7.5556
Couple, 3+ children	978	348	2.8103	56	14	4.0000
Single male with children	123	31	3.9677	42	11	3.8182
Single female with children	1512	462	3.2727			
Couple, 0 children	5818	1575	3.6940	119	27	4.4074
Single male age 0-29	3389	679	4.9912			
Single male age 30-54	2324	440	5.2818	172	19	9.0526
Single male age 55-64	491	124	3.9597			
Single female age 0-19	578	147	3.9320			
Single female age 20-39	1827	453	4.0331	107	29	3.6897
Single female age 40-59	1085	332	3.2681			
Pensioner couple age 65-74	1776	526	3.3764	53	13	4.0769
Pensioner couple age 75+	867	254	3.4134			
Single male age 65+	908.7	286	3.1773	26	5	5.2000
Single female age 60-74	1647.4	478	3.4464	90	25	3.6000
Single female age 75+	1724.9	431	4.0021			
<b>Total family units</b>	<b>29400.0</b>	<b>7976</b>		<b>793</b>	<b>165</b>	

### 3.2.3 Item non-response and under-reporting

Income and household composition data are collected by interviews with all household members aged 16 or over. The FES response rules require detailed information on all income components to be provided by direct reporting; proxy answers are not allowed. If this information is not provided by all household members aged 16 and over, then the entire household is treated as non-responding. Consequently, no major components of income have item non-response.

Comparisons can be made of weighted income components from FES with other sources. Comparing with income tax records, it is found that overall, FES underestimates slightly the amount of tax paid (by 3% in 1995/96) and overestimates the number of tax payers (by 5% in 1995/96). The distribution of tax payers and tax paid in the FES is similar to the distribution from administrative sources except at the very top of the income range. The proportion of tax payers paying in excess of £10,000 income tax in 1995/96 is similar, but the amount of tax paid is 25% lower in the FES.

Comparisons with administrative records of benefit receipt can be difficult to interpret, because there are several possible explanations for the differences, including: inaccurate recording of benefit receipt in the FES (particularly where one benefit may be confused with another); administrative counts including those not in private households (see section 3.1 above); or being affected by fraudulent receipt including multiple identity fraud. But it appears that low-income non-pensioners without children - particularly young, single adults - and low-income families in

private rented accommodation, are under-represented in the FES. But there is not strong evidence that the low income population as a whole is under-represented.

Comparisons can also be made with National Accounts (NA) aggregates, although it is not always straightforward to make adjustments to make the two sources strictly comparable. Two particular sources of income appear to be problematic: income from self-employment and income from capital. According to Harris (1998) the weighted FES aggregate for the first of these is 67% of the NA estimate and the figure for investment income is 52%. These comparisons are not able to fully take account of differences in timing and coverage in the two sources. While there are reasons to believe that a "true" comparison would not show such large discrepancies,<sup>19</sup> it remains the case that there does appear to be a problem of under-reporting of these incomes, perhaps particularly by high income people. It is also possible that there is under-representation of the self-employed. (The number reporting income from self-employment in FES is 80% of an Inland Revenue figure.)

### **3.3 Adjustments to variables**

The FES data are obtained from the Data Archive at Essex University.<sup>20</sup> Adjustments to variables are kept to a minimum. There is some minor data cleaning that is done to make sure that the households and relationships of individuals within households, are coherent (for example, that young children are not living alone). So the information on frequency of family types shown in Table 3.1 does not correspond exactly with the information that would be obtained from the original data.

Self-employment income that is reported to refer to some previous year is updated to 1995/6 using an index of average earnings.

### **3.4 Imputations and assumptions**

#### *3.4.1 Time period*

Information on earnings refers to the last pay period (week, 4-week, month, etc.). Similarly, information about pensions and benefits refers to receipts in 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 figures are available; in some cases this may be several years prior to the interview. Investment income is also based on a 12-month receipt period.

All monetary amounts in the FES 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 simulated income tax (based on annual income) does not take account of changes that may happen during the year. On the

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<sup>19</sup> Estimates fluctuate year by year (e.g. in the last 6 years 66%-87% (self-employment); 49%-63% (investment income)); NA self-employment income is inflated by 16% for under-reporting; NA investment income includes private trusts which are not likely to be included in FES; NA personal sector investment income is a residual and hence subject to a relatively wide margin of error.

<sup>20</sup> Data from the Family Expenditure 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.

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.

### *3.4.2 Gross Income*

Gross incomes are imputed using the simple formula:

Gross income = net income + tax + other deductions

FES 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 (in 1995/6) investment income is 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 are likely to make lump sum tax payments or receive tax refunds. This information is collected in the FES. 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.

### *3.4.3 Other imputed variables*

Other 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, Contracted out or “Married Woman’s rate”) is imputed from information on (imputed) gross earnings and the contribution payment, as well as other information about the individual (age, sex, marital status, whether contributing to a private scheme).
- FES 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). 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.

For more information about the transformation of FES variables into EUROMOD database variables see the UK Data Requirements Document (DRD).<sup>21</sup>

### 3.6 Updating to 1998

The factors that are used to update monetary variables from the mid-point of the data year (October 1995) to June 1998 are shown in Table 3.1.

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 1995/6.

**Table 3.2 Updating factors mid-1995/6 to June 1998**

Income source/index type	name	value	notes
Price index	$P\_ind$	1.086	
Earned income:			
Self employed: non-farm	$E\_ind_1$	1.125	= $E\_ind$
Self employed: farm	$E\_ind_2$	1.125	
Employed: manual			
male	$E\_ind_3$	1.127	
female	$E\_ind_4$	1.120	
Employed: non-manual			
male	$E\_ind_5$	1.135	
female	$E\_ind_6$	1.134	
Investment income	$I\_ind$	1.086	= $P\_ind$
Rent	$R\_ind$	1.098	
Mortgage interest	$M\_ind$	1.263	
Benefits (not simulated benefits)	$B\_ind_1$ $B\_ind_2$ $B\_ind_3$	1.099 1.085 1.166	most benefits unemployment-related war pension
Taxes (not simulated)	$T\_ind_1$	1.244	council tax

**Sources:**

$P\_ind$ : RPI all items weighted mean of 1995 and 1996 annual averages (3/4 of 1995 and 1/4 of 1996) to 1998 annual average. *Labour Market Trends* table H14.

$E\_ind$ : Average earnings index weighted mean of 1995 and 1996 annual average to 1998 annual average. *Labour Market Trends* table E1.

$E\_ind_3$  to  $E\_ind_6$ : Mean of April 1995 and April 1996 *New Earnings Survey* 1998 Table A28; projected NES estimates (to July 1998) from *Labour Market Trends* table E11.

$R\_ind$ : RPI element for rent October 1995 to June 1998. *Labour Market Trends* table H11 (Sept 1998) and 6.2 (Dec 1995).

$M\_ind$ : RPI element for mortgage interest October 1995 to June 1998. *Labour Market Trends* table H11 (Sept 1998) and 6.2 (Dec 1995).

$B\_ind_1$  to  $B\_ind_3$ : actual uprating of main benefit components (various sources).

$T\_ind$ : RPI element for council tax October 1995 to June 1998. *Labour Market Trends* table H11 (Sept 1998) and 6.2 (Dec 1995).

<sup>21</sup> Also see Mitton, L. "EUROMOD: UK Database Documentation", September 1999 (mimeo).

## 4. Validation

### 4.1 Aggregate Validation

#### 4.1.1 Method

First, in Table 4.1 statistics on benefits and taxes that are not simulated by EUROMOD are compared with external sources. This provides an assessment of the quality of the database and also provides some useful background information for the validation of simulated components of income which may depend on or be associated with the non-simulated components.

Validation of simulated elements of income is carried out both in relation to independent external sources and in relation to output from the national UK tax-benefit model POLIMOD.<sup>22</sup> The POLIMOD estimates are based on the same data (1995/6 Family Expenditure Survey) with the same weights. Updating factors to 1998 are slightly different. (In particular POLIMOD updates employment earnings by differential factors depending on sex and earnings level; EUROMOD distinguishes by sex and manual/non-manual occupations.)

Comparisons with POLIMOD provide a check on the tax-benefit routines in EUROMOD. Comparisons of both model outputs with external sources provide a check on the model database and on the method as a whole.

POLIMOD usually assumes some degree of non-take-up of simulated means-tested benefits (Family Credit, Income Support, Housing Benefit and Council Tax Benefit). EUROMOD currently assumes 100% take-up. POLIMOD results for these benefits are provided both ways, so that comparisons can be made.

Table 4.2 shows comparisons of the number of benefit recipients and tax and contribution payers. Table 4.3 shows the aggregate annual expenditure or revenue from each instrument.

#### 4.1.2 Taxes and benefits in FES data

Table 4.1 calculates the ratio of EUROMOD (weighted FES) expenditures and numbers of recipients to estimates drawn from administrative statistics for some of the main social security benefits that are not simulated by the model.

Expenditure on *Incapacity Benefit* is over-estimated (by 9%) but the number of recipients is well-estimated (just 4% too many). The explanation for the expenditure over-estimate is that the data year, 1995/6 was a year of transition to the new incapacity benefit from a range of several benefits covering sickness and invalidity. Current claimants were protected from adverse effects, resulting in higher per recipient expenditure than would be expected after the transitional phase (in 1998), other things being equal.

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<sup>22</sup> See Redmond G, H Sutherland and M Wilson, 1998, *The arithmetic of tax and social security reform: a user's guide to microsimulation methods and analysis*, Cambridge University Press.



**Table 4.1 Tax-benefit instruments that are included but not simulated by EUROMOD: comparison of aggregates with external statistics for 1998**

BENEFIT	Recipients (thousand)			Expenditure £m / year		
	External source	Weighted FES	Ratio	External source	Weighted FES	Ratio
Incapacity Benefit	1,640 <sup>a</sup>	1,710	1.04	7,090	7,710	1.09
Retirement Pension (basic)	10,830	9,390	0.87	31,916	27,380	0.86
Widow's Benefit	270	280	1.04	968	900	0.93
Attendance Allowance	1,230 <sup>d</sup>	760	0.62	2,682	1,650	0.62
Disability Living Allowance	1,980 <sup>e</sup>	1,273	0.64	5,331	3,010	0.56
Severe Disablement Allowance	390 <sup>f</sup>	250	0.64	993	690	0.69
Invalid Care Allowance	370 <sup>b</sup>	350	0.95	781	730	0.93
Industrial Injuries Disablement Benefit	280 <sup>b</sup>	260	0.93	712	600	0.84
War Pension	310 <sup>b</sup>	190	0.61	1,272	550	0.43
Disability Working Allowance	16 <sup>i</sup>	9	0.56	49	59	1.20
Council Tax (payers; revenue)	21,310 <sup>j</sup>	23,650	1.01 <sup>j</sup>	12,100	14,610	1.21

**Notes:** EUROMOD figures are for UK; External figures are all for GB not UK, with the exception of Council Tax payers which is for England and Wales only;

<sup>a</sup> May 1998; <sup>b</sup> December 1998; <sup>c</sup> child benefit plus lone parent benefit; <sup>d</sup> February 1999; <sup>e</sup> February 1998; <sup>f</sup> March 1998; <sup>g</sup> On IS + not on IS; <sup>h</sup> average for 1998; <sup>i</sup> January 1999; <sup>j</sup> chargeable dwellings England and Wales only - ratio uses FES figure adjusted by 0.911 (ratio of population in E+W to GB in 1998.)

**Sources:** *Benefits:* Social Security Statistics 1999 and 2000, Department of Social Security; *Council Tax:* Financial Statement and Budget Report March 2000, HM Treasury, HC346, TSO and Council Tax Demands and Precepts 1998-99, CIPFA Statistical Information Service

*Basic Retirement Pension* is underestimated in the FES data (by a similar proportion - 14% - for both expenditure and recipients). This is because a sizeable number of pension recipients do not live in households but instead are in hospital or residential care. These people are included in the administrative statistics but are not covered by the household survey. Other pensioners (a smaller group) live abroad for some or all of the year. These are naturally not captured by a UK survey but are included in the administrative statistics.

Many of the disability benefits are under-estimated. In the case of *Severe Disability Allowance* (SDA) this is thought to be explained by respondent confusion between SDA and the disability premia in Income Support. Many claimants of one of these receive both and may not report the actual situation accurately when asked in the survey. *Attendance Allowance and Disability Allowance* were in the process of reform in 1995 and had become more generous and with a wider coverage in 1998. *Disability Working Allowance* was also new in 1995. It did not replace a previous benefit and thus took some time to be claimed by people who were entitled. This explains the shortfall in the EUROMOD claimant count, but not in the over-estimate of expenditure. Since sample numbers are small, these figures cannot be expected to be reliable. There is no obvious explanation for the shortfall in War Pension, although it is quite likely that recipients may be in residential care rather than living in households.

Comparable statistics on *Council Tax* are not easy to find. The figures shown in Table 4.1 suggest that revenue is over-estimated by 20%, compared with receipts information. Number of households paying Council Tax looks well-estimated. However, the figures are not at all comparable - the official statistic refers to chargeable dwellings rather than actual payments and covers only England and Wales. The EUROMOD figure has been adjusted to exclude Scotland using a very approximate method. Thus the good comparison may be accidental. On the other hand, the average payment in EUROMOD (£618 per year) corresponds closely to the average Council Tax per Chargeable Dwelling (£603) for England and Wales from the official source (CIPFA, 1998, Table 6).

#### 4.1.3 Simulated Income tax

POLIMOD and EUROMOD estimates compare well, with differences within the range that can be explained by different updating factors.

The data contain too few people with incomes high enough to pay income tax. The shortfall is less than 10%. However, the shortfall in income tax receipts is larger (about 20%). Looking at higher rate taxpayers and higher rate tax explains most of the shortfall. Nearly all the shortfall in tax revenue is due to the shortfall in higher rate revenue. The number of higher-rate payers is also too small, but the shortfall is less. This suggests that the data contain too few very rich people and/or there is under-reporting of high incomes.<sup>23</sup>

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<sup>23</sup> In the UK Department of Social Security's *Household Below Average Income* statistics, a small number of households with high-income individuals are re-weighted and incomes are adjusted using information from the Inland Revenue's Survey of Personal Incomes (income tax records). The adjustment enables an accurate estimate of mean income to be obtained on which to base estimates of numbers of people with income below proportions of the mean.

**Table 4.2: Numbers of recipients/ payers of benefits/taxes that are simulated in EUROMOD: a comparison with external statistics**

	Units	EUROMOD (a)	POLIMOD (full take-up) (b)	POLIMOD (partial take-up)	External source (c)	Ratio* (a)/(c) or (b)/(c)	Source	Notes about source
<b>Recipients/payers (thousand)</b>								
Income tax -all	individuals	24,700	24,630	24,630	26,700	<b>0.925</b>	(1) Table 2.1	1998/9
Income tax - highest mtr	individuals		1,850	1,850	2,300	<b>0.804*</b>	(1) Table 2.1	1998/9
SICs employers	individuals	18,420	18,420	18,420	22,140	<b>0.832</b>	(2) Table H1.01	<b>1996</b>
SICs employees	individuals	20,720	18,420	18,420	22,140	<b>0.832*</b>		
SICs self-employed	individuals		2,400	2,400	2,030	<b>1.182*</b>		
Child benefit	families		7,250	7,250	6,970	<b>1.042</b>	(2) Table G1.03	Mean of Dec97 and Dec98, GB
	households	7,230	7,220	7,220				
One parent benefit	families		1,670	1,670	1,040	<b>1.606</b>	(2) Table G1.08	Mean of Dec97 and Dec98, GB
	households		1,670	1,670				
Family credit	families	-	750	520	790	<b>0.924</b>	(2) Table A1.04	Feb 99, GB
	households	730	750	520				
Income Support (IS) including means-tested JSA	families	-	5,820	4,710	4,860	<b>1.191</b>	(2) Table A2.02	Feb 99, GB
	households	5,370	5,400	4,410				
Housing benefit - on IS	households		3,390	2,700	2,860	<b>1.185*</b>	(2) Table A3.01	May 98, GB
Housing benefit - not on IS	households	5,190	1,840	2,270	1,620	<b>1.136*</b>	(2) Table A3.01	May 98, GB
Council tax benefit	households	7,050	7,140	6,350	5,330	<b>1.323</b>	(2) Table A4.01	May 98, GB

**Sources:** (1) Inland Revenue Statistics, 1999, Inland Revenue ASD, GSS, TSO.

(2) Social Security Statistics, 1999, Department of Social Security, GSS, CDS.

(3) UK National Accounts, 1999, Office for National Statistics, GSS, TSO.

\* uses (b) / (c) ie POLIMOD-based ratios.

**Table 4.3: Revenue/cost of taxes/benefits that are simulated in EUROMOD: a comparison with external statistics for 1998**

	EUROMOD (a)	POLIMOD (full take-up) (b)	POLIMOD (partial take-up)	External source (c)	Ratio* (a)/(c) or (b)/(c)	Source	Notes about source
<b>Revenue/cost £million / year</b>							
Income tax -all	69,230	69,580	69,580	86,510	<b>0.800</b>	(1) Table 2.8	1998/9, net receipts
Income tax - highest mtr		13,070	13,070	24,000- 28,000	<b>0.503*</b>	(4) Table 4	various estimates
SICs employers	26,080	26,040	26,040	29,240	<b>0.882</b>	(3) Table 10.1	1998
SICs employees	23,190	21,220	21,220	23,060	<b>0.920*</b>	(3) Table 10.1	1998
SICs self-employed		1,900	1,900	1,840	<b>1.033*</b>	(3) Table 10.1	1998
Child benefit	7,730	7,220	7,220	7,280	<b>0.992*</b>	(2) Table G1.05	1998/9 estimate, GB
One parent benefit		490	490	320	<b>1.531*</b>	(2) Table G1.08	1998/9 estimate, GB
Family credit	1,700	1,750	1,190	2,480	<b>0.685</b>	(2) Table A1.03	1998 GB
Income Support (IS) + means-tested JSA	16,070	16,520	14,120	14,880	<b>1.080</b>	(2) Table A2.03	1998, GB
Housing benefit - on IS	11,560	8,450	6,870	11,220	<b>1.030</b>	(2) Table A3.03	1998/9 forecast, GB
Housing benefit - not on IS		2,880	2,530				
Council tax benefit	2,860	2,760	2,530	2,480	<b>1.153</b>	(2) Table A4.02	1998, GB

**Sources:** (1) Inland Revenue Statistics, 1999, Inland Revenue ASD, GSS, TSO.

(2) Social Security Statistics, 1999, Department of Social Security, GSS, CDS.

(3) UK National Accounts, 1999, Office for National Statistics, GSS, TSO.

(4) HM Treasury, Tax Ready Reckoner, various years.

\* uses (b) / (c) ie POLIMOD-based ratios.

#### *4.1.4 Simulated National Insurance Contributions (NICs)*

Both EUROMOD and POLIMOD contain too few employees paying NICs (the shortfall is about 17%). UK employer contributions have no ceiling. Since the shortfall in revenue for employer contributions (12%) is greater than that for employee contributions, which do have a ceiling (8%), this suggests that high earnings are under-represented in the data.

On the other hand, the POLIMOD figure for self-employed contributors (not separately identified in EUROMOD output) suggests that it may be too high in EUROMOD too. The revenue collected from self-employed contributions is also too high. This is interesting given that comparisons of aggregate gross self-employment income with National Accounts suggests a large shortfall of this type of income in the FES (see section 3.2.3). Given that there is a ceiling on the amount of self-employed contributions, together these two findings suggest that the shortfall in self-employment income is confined to people with large amounts of such income. (Either they are under-represented or they under-report.)

It should be noted that the administrative statistics on NICs refer to 1996, which is closer to the data year than the simulated year. Thus explanations for differences cannot rest on changes in employment and self-employment between 1995/6 and 1998. Any such changes would introduce other discrepancies which have not been illuminated here.

#### *4.1.5 Simulated Child Benefit*

Both POLIMOD and EUROMOD produce estimates very close to the administrative figures. Given the universal nature of the benefit and the fact that the weights control for families with children (in 1995/6), this is not surprising. Any discrepancy is partly due to the exclusion of Northern Ireland from the administrative statistic. It is not due to demographic changes between the data year and 1998: the administrative figure for the number of families in receipt in 1995/6 is much the same as in 1998.

#### *4.1.6 Simulated One Parent Benefit*

There is an apparent over-estimate in recipients and expenditure of as much as 60% in POLIMOD and by implication also in EUROMOD. This is explained by the fact that some lone parents claim Income Support (IS) first. Since OPB is counted 100% in the income test for IS, there is no point in them claiming it once they are in receipt of IS. (It is not thought to be worthwhile to do anything about this overlap. OPB is in the process of being phased out.)

#### *4.1.7 Simulated Family Credit*

There are too few recipients in both models, even when take-up is assumed to be 100%. The short-fall is about 8%. However, it is well-known that the take-up rate is less than 100% and was estimated by the Department of Social Security (DSS) to be between 55% and 60% for couple families and 78% and 85% for lone parent families on a caseload basis in 1998/9.<sup>24</sup> When these proportions are applied on a random basis in POLIMOD, the number of recipients becomes 66% of the administrative figure. There is no conclusive explanation for this shortfall. One possible contribution to the under-estimate is the fact that once entitled, families receive FC for 6 months regardless of change in circumstances. We cannot model this “overhang” because we do not have information on the previous 6 months nor on the timing of the claim. However, in calculating their take-up estimates DSS take account of the overhang by inflating the numbers they estimate to be entitled non-recipients. They use the

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<sup>24</sup> Department of Social Security, 2000, *Income Related Benefits: Estimates of Take-Up in 1998-99*. London: DSS Analytical Services Division; Table 5.1. The ranges represent a 95% confidence interval due to the potential effects of sample variation.

proportion of claimants who do not successfully renew their claim at the end of the six month period as a measure of the proportions of claimants who become non-entitled while in receipt. The factors they apply are 1.205 for couples and 1.163 for lone parents (see DSS (2000), chapter 6). Deflating the administrative total of FC recipients by a simple average of these two factors<sup>25</sup> brings it closer to the POLIMOD partial take-up estimate in Table 4.2 but does not fully account for the shortfall. Thus the overhang partially accounts for the modelled shortfall in recipients but does not fully explain it.

Another possibility is that FES under-represents likely Family Credit recipients. It is quite reasonable to suspect that low-income families combining paid work with responsibility for children would be less likely to be available to complete survey interviews than parents in general. We have no direct evidence about non-response patterns of Family Credit recipients. However, the weighted number of recipients in the data in 1995/6 - 1,390 thousand - is not only lower than the administrative figure for 1998, it is also lower than the number simulated to be entitled.

Ideally, both the overhang and non-takeup should be modelled. Simply assuming 100% take-up and getting roughly the right number of recipients is not adequate. It would not capture two important features of FC: that there are families who are entitled but do not receive it; and that there are families who receive it whose current income or circumstances would make them ineligible. Both these groups are relatively large and should be identified if possible.

Take-up rates on an expenditure basis are not so low: between 73% and 79% (DSS, 2000, Table 5.2). This implies that families with large Family Credit entitlements are more likely to claim than those with small entitlements. No account of this is taken in the POLIMOD incomplete take-up results. One would therefore expect the expenditure shortfall to be greater than the recipient shortfall and this is certainly the case - the POLIMOD ratio is 48% compared with a recipient ratio of 66%. However, the shortfall in expenditure is also large if take-up is assumed to be 100% - the ratio is 69%. This again suggests that to simply assume 100% take-up, thereby achieving a recipient count fairly close to the administrative figure, is not the right approach. Even accounting for the shortfall in recipients, simulated entitlements are too small, on average by a factor of 35%. The families simulated to receive Family Credit must have earnings that are too large, too few children or too much other income or capital compared with actual Family Credit recipients. This suggests under-representation of the Family Credit population. *Over-reporting* of incomes to FES seems unlikely, although *under-reporting* to benefit authorities, or careful timing of benefit claims are both possibilities.

#### *4.1.8 Simulated Income Support*

Comparing both 100% take-up estimates with the external figure we find too much Income Support (IS) in both models (by 8% on an expenditure basis and 19% on a recipient basis). This does suggest that non-takeup should be modelled in some way. DSS estimates IS caseload take-up rates to be between 79% and 89% (DSS, 2000; Table 1.1). POLIMOD estimates using these take-up proportions are slightly too low, but are quite close to the administrative figures on both a recipient and an expenditure basis.

#### *4.1.9 Simulated Housing Benefit*

The number of Housing Benefit (HB) recipients is over-estimated by about the same proportion as with Income Support if full take-up is assumed. If DSS take-up rates are applied

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<sup>25</sup> 1.184 : the numbers of couple and lone parent recipients of FC are roughly equal.

(as in the POLIMOD estimates) then the numbers of families on IS receiving full HB match quite well with the administrative figure (94%) but the numbers on “tapered” HB remain too high (by 40%). Using the full take up assumption the number of households simulated to receive tapered HB actually *falls* to a level not too far from the administrative figure. This is because, using the partial take-up assumption some households not taking up their entitlement to IS are simulated to claim tapered HB instead. This is of course something that happens in reality. The extent of it is unknown.

The expenditure estimates for HB are too low if partial take-up is modelled (84%) and slightly too high if 100% take-up is assumed (by 3%). This suggests that the EUROMOD average HB payment is too low (£42.91 per week instead of £48.16 using administrative statistics).

#### *4.1.10 Simulated Council Tax Benefit*

Comparisons for Council Tax Benefit (CTB) are similar to those for HB except more extreme. The number of recipients is over-estimated by 32% on a 100% take-up basis and still over-estimated by 19% if DSS non-takeup estimates are used in modelling. The over-estimation of expenditure is less - 15% using 100% take-up and 2% using incomplete take-up. Average payments are again under-estimated. The EUROMOD figure is £7.83 per week, compared with an administrative figure of £8.95.

## **4.2 Income distribution and poverty estimates**

Nearly all the official UK income distribution estimates use the McClements equivalence scale. Thus the statistics shown in Table 4.4 are not fully comparable since the EUROMOD figures use the modified OECD scale. The measure of household disposable income is not the same in the two official sources and both differ from the definition used by EUROMOD. In addition, the underlying micro-data are not the same. The official sources use micro-data collected in 1998/9. EUROMOD uses data collected in 1995/6 updated to mid-1998 and with 1998 policy simulated. One would not expect the results to be the same and the comparisons are provided simply to give a preliminary and basic assessment.

Most differences in results could be explained by the differences in the calculations or underlying data. The EUROMOD poverty headcounts are close to those from the official source (HBAI). The Gini coefficient is lower in EUROMOD - one part of the explanation could be the 100% take-up assumption for means-tested benefits reducing the number of EUROMOD households with very low incomes. This is consistent with the fact that the first decile point in the EUROMOD distribution is higher than the first point in the official distribution, whereas all other points are lower. (There could be other explanations.) Mean unequivalised household incomes (calculated in the same way but using a different income concept, different data and weighting procedures) are substantially lower in EUROMOD (£17.1 compared with £19.2 thousand). This would be consistent with EUROMOD updating procedures not capturing in full the growth in some (or all) incomes.

**Table 4.4 Income distribution and poverty comparisons using EUROMOD and official UK sources: 1998**

	EUROMOD <sup>1</sup>	TETBHI <sup>2</sup>	HBAI <sup>3</sup>
Gini coefficient	0.31	0.35	
Decile points (equivalised £/year)			
1 <sup>st</sup>	4,556	4,437	
2 <sup>nd</sup>	5,442	5,820	
3 <sup>rd</sup>	6,429	7,355	
4 <sup>th</sup>	7,608	8,722	
5 <sup>th</sup>	9,079	10,091	
6 <sup>th</sup>	10,478	11,764	
7 <sup>th</sup>	12,225	13,613	
8 <sup>th</sup>	14,632	16,222	
9 <sup>th</sup>	18,694	21,226	
Mean (unequivalised £/year)	17,086	19,230	
Mean (equivalised £/year)	10,664	11,042	10,356
Median (equivalised £/year)	9,079		8,372
% below 50% mean	19.0		19
% below 60% median	20.0		18

**Notes and sources:** <sup>1</sup> **EUROMOD** estimates are based in 1995/6 Family Expenditure Survey (FES) data updated to 1998. Household Disposable Income (HDI) is equivalised using the modified OECD scale (1, 0.5, 0.3) and households are weighted by their size. The exception to this is the unequivalised mean which is calculated on a per-household basis (ie the same basis as the TETBHI estimate). Poverty headcounts are of individuals in households with equivalised income below the poverty line. EUROMOD monthly income output has been multiplied by 12.

<sup>2</sup> **TETBHI** (The Effect of Taxes and Benefits on Household Income) for 1998/9 is published by the Office for National Statistics in *Economic Trends* No. 557, April 2000. It uses FES data for 1998/9 which have been annualised, approximately. All calculations are on a household basis (not weighted by household size) and use the McClements equivalence scale. This scale uses the couple as the base and weights a single person by 0.61. Equivalised incomes have been multiplied by 0.61 to put them on the same basis as those using the OECD scale (which uses the single person as base). This adjustment does not alter the fact that use of the McClements scale will cause households to be ranked differently than if the OECD scale were used. In particular, families with young children are given a relatively small weight in the McClements scale and will appear higher up the distribution than under the OECD scale. Data are taken from Table A and Table 2A (Appendix 1).

<sup>3</sup> **HBAI** Households Below Average Income for 1998/9 is published by the Department of Social Security. It uses data from the 1998/9 Family Resources Survey. Top incomes are inflated using information from the Survey of Personal Incomes. The calculations use the McClements scale and weight household incomes by household size. The same adjustment by 0.61 as in TETBHI has been made to re-scale equivalised incomes to the same basis as the OECD scale. The published figures are updated to February 2000 prices and have here been deflated again to 1998/9 prices using RPI (a factor of 1.023). HBAI incomes are published in weekly terms and here have been multiplied by 52. Data are taken from Tables A2, F2 and J2 .



### 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.

- The sample is relatively small. Care should be taken in interpreting results for small sub-groups.
- The weights do not control for differential non-response according to any dimension except family type. No adjustments are made for structural changes in the characteristics of the population between the data year (1995/6) and the simulation year (1998).
- There appear to be too few individuals with employment income.
- There is a shortfall in people with higher incomes and in self-employment income and investment income. It is likely that the main problem is a shortfall of high income people with these sources of income or an under-recording of these sources for high income people.
- The model contains too few families entitled to Family Credit. It is possible that there are too few people with *low* earnings.
- Neither non-takeup nor receipt of benefits based on past circumstances (i.e. Family Credit) are modelled. This has the effect of (a) inflating the incomes of families who do not receive these benefits and reducing the number of people in very poor families, (b) inflating the cost of these benefits and the cost of making them more generous, (c) diminishing the relative impact of benefits that do not have problems of non-takeup.