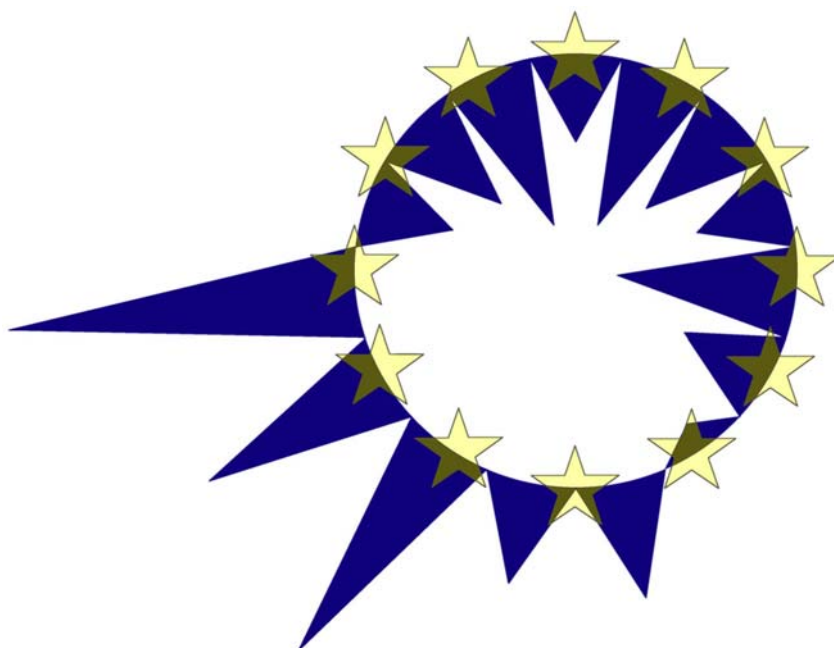


EUROMOD

COUNTRY REPORT



EUROMOD Country Report

GREECE
(1998 TAX-BENEFIT SYSTEM)

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1. The tax-benefit system in 1998

1.1. Social benefits

Social benefits (defined so as to cover the entire range of income transfers or benefits in cash) have two major components: *contributory* and *non-contributory* benefits.

Contributory benefits are related to employment and are financed *via* employer and employee contributions. Access to benefits is dependent on claimants' contributory record and the occurrence of a specified contingency such as retirement or unemployment. Benefit levels are, as a rule, positively related to previous earnings. In Greece, as elsewhere in continental Europe, contributory benefits are provided by social insurance "funds" (i.e. semi-autonomous entities created for that purpose).

Non-contributory benefits, funded out of general taxation, can be distinguished into income-tested *social assistance* and non-income-tested *categorical* or *universal benefits* (depending on access rules).

Social assistance benefits are awarded following a test of the claimant's income or a "means test" (that is, a test of both income and wealth) and are designed to raise the incomes of families in poverty, sometimes explicitly to some minimum standard. In theory, benefit rates are inversely related to income. In practice, many such benefits in Greece are awarded at a flat rate.

Categorical or universal benefits are granted on the basis of a specified contingency, such as disability or birth of a child, to all individuals within that category. Therefore, categorical or universal benefits are not conditional on either income or contributions. As a result, benefit amounts are typically set at a flat rate.

Table 1 shows the relative strength of the various types of social benefits in Greece in terms of expenditure in 1998. Most benefits were contributory and earnings-related. No more than 4% of spending on social security was income tested.

Table 1: Social benefits by type (1998)

| | income tested | not income tested | total |
|------------------|---------------|-------------------|-------|
| contributory | 0.2 | 86.2 | 86.3 |
| non-contributory | 3.8 | 9.8 | 13.7 |
| total | 4.0 | 96.0 | 100.0 |

Note: Own elaboration of data collected from social insurance organisations and other benefit agencies. Social benefits are defined as the aggregate of social transfers in cash. Total expenditure on social benefits in 1998 was 5,187 billion drs or €15,222 million.

Table 2 looks at the composition of social benefits in Greece by category in 1998. As much as 90% of all benefits were retirement pensions. All other benefits taken together accounted for less than 1.5% of GDP.

Table 2: Social benefits by category (1998)

| | € million | % all benefits | % GDP |
|-----------------------------------|---------------|----------------|--------------|
| retirement benefits | 13 655 | 89.7 | 12.68 |
| family benefits | 532 | 3.5 | 0.49 |
| unemployment benefits | 492 | 3.2 | 0.46 |
| sickness benefits | 328 | 2.2 | 0.30 |
| disability benefits | 179 | 1.2 | 0.17 |
| other benefits | 37 | 0.2 | 0.03 |
| all social benefits | 15 222 | 100.0 | 14.14 |
| <i>of which: non-contributory</i> | 2 081 | 13.7 | 1.93 |
| <i>of which: income tested</i> | 611 | 4.0 | 0.57 |

Note: Retirement benefits cover old age, invalidity and survivor pensions, including the pensioner social solidarity benefit *EKAΣ*. Other benefits include housing and emergency benefits.

Source: Own estimates from data collected from benefit agencies and other sources.

1.1.1. Retirement benefits

Pensions are provided by a multiplicity of social insurance agencies or “funds”, mostly operating earnings-related, pay-as-you-go schemes. In 1998 the largest providers of social insurance pensions were *IKA* (private sector workers), *OΓA* (farmers), *TEBE* (the fund of most own-account workers)¹ and the government (civil servants).

Table 3: Expenditure on retirement benefits (1998)

| | € million | % all benefits | % GDP |
|---|---------------|----------------|--------------|
| <i>contributory pensions</i> | | | |
| social insurance pensions (except farmers) | 8 559 | 56.2 | 7.95 |
| civil servants pensions | 2 954 | 19.4 | 2.74 |
| social insurance separation payments | 488 | 3.2 | 0.45 |
| farmer supplementary pension | 152 | 1.0 | 0.14 |
| <i>non-contributory pensions</i> | | | |
| farmer basic pension | 1 130 | 7.4 | 1.05 |
| pensioner social solidarity benefit <i>EKAΣ</i> | 136 | 0.9 | 0.13 |
| war & national resistance | 188 | 1.2 | 0.04 |
| pensions of non-insured elderly | 48 | 0.3 | 0.17 |
| all retirement benefits | 13 655 | 89.7 | 12.68 |
| <i>of which: non-contributory</i> | 1 502 | 9.9 | 1.39 |
| <i>of which: income tested</i> | 183 | 1.2 | 0.17 |

Note: Social insurance covers old age pensions, invalidity pensions and survivor pensions from all social insurance organisations except the farmers’ fund *OΓA*. Both primary and supplementary pensions are included. Note that separation payments, paid as lump sum, are recorded separately. Farmer supplementary pensions include old-age, survivor and invalidity supplementary pensions. Farmer basic pensions include old-age, survivor, invalidity and orphan basic pensions.

Source: Ministry of Labour & Social Insurance (1998), Ministry of Finance (1997), National Statistical Service of Greece (2000) and own estimates from data collected from social insurance funds.

¹ In March 1999, *TEBE* merged with two smaller schemes of the self-employed (*TAE* and *TΣA*) to create *OAEΕ*.

Out of a total pension expenditure of over €13,650 million, about €12,150 million or 11.3% of GDP was in 1998 spent on contributory pensions. This is shown in Table 3.

1.1.2. Family benefits

Income transfers to families with children include non-contributory benefits and occupational family allowances. In 1998, total expenditure on the various schemes amounted to €532 million (0.5% of GDP), equivalent to 3.5% of the social security budget. This is shown in Table 4.

Table 4: Expenditure on family benefits (1998)

| | € million | % all benefits | % GDP |
|---|------------|----------------|-------------|
| lifetime pension to many-children mothers | 174 | 1.1 | 0.16 |
| large family benefit | 131 | 0.9 | 0.12 |
| 3rd child benefit | 67 | 0.4 | 0.06 |
| unprotected child benefit | 18 | 0.1 | 0.02 |
| civil servants family allowance | 94 | 0.6 | 0.09 |
| <i>OAEA</i> family allowance | 48 | 0.3 | 0.04 |
| all family benefits | 532 | 3.5 | 0.49 |
| <i>of which:</i> non-contributory | 390 | 2.6 | 0.36 |
| <i>of which:</i> income tested | 390 | 2.6 | 0.36 |

Note: As an occupational allowance, civil servants family allowance is classified here as a contributory benefit, although strictly speaking no contributions are actually paid.

Source: Ministry of Labour & Social Insurance (1998), Ministry of Finance (1997), National Statistical Service of Greece (2000) and own estimates from data collected from social insurance funds.

1.1.3. Unemployment benefits

Unemployment insurance is mandatory for all employees except tenured civil servants and agricultural workers. The “Manpower Employment Organisation” *OAEA* runs a variety of schemes, the most important of which is “ordinary unemployment benefit”. Total expenditure on all unemployment insurance in 1998 amounted to €492 million (0.5% of GDP), accounting for 3.2% of the social security budget.

1.1.4. Sickness benefits

Most social insurance funds provide sickness benefits in cash. These include statutory sick pay, maternity leave, birth grants, compensation for absence due to accidents at work and death grants, plus a variety of other benefits. Total expenditure on all sickness benefits in 1998 amounted to €328 million (0.3% of GDP), accounting for 2.2% of the social security budget.

1.1.5. Disability benefits

These are non-contributory benefits, funded out of general taxation and administered by local government at the prefecture level (*Νομαρχίες*). Contributory invalidity pensions are not included. Although not explicitly income tested, disability benefits are reduced or withdrawn altogether if the recipient is in employment, a pensioner, or in receipt of invalidity pension.

Disability benefits are highly heterogeneous by type of disability and sometimes by category of recipient. There are 10 categories and 22 sub-categories of disability, in addition to a generic “mobility allowance”. Out of 104,160 claimants 53,750 received “severe physical disability benefit” in 1998.

1.1.6. *Housing and emergency benefits*

This heading comprises cash assistance to tenants only, excluding both assistance in kind (such as the provision of social housing) and benefits to owner-occupiers (such as mortgage relief). The main instrument of cash assistance to tenants is the rent subsidy provided by the “Workers Housing Organisation” *OEK* (which is financed by payroll contributions and covers all private sector employees irrespective of social insurance membership). A similar non-contributory benefit is paid by prefectures to landlords on behalf of non-insured elderly who are unable to meet their housing costs. Finally, emergency benefits may be paid to return migrants and immigrants of Greek origin by prefectures. Various lump-sum benefits may also be provided as modest assistance for resettlement expenses, transportation of household durables etc.

1.2. Taxes and social contributions

On the revenue side, individuals pay direct or indirect taxes and social contributions. Table 5 shows the relative strength of each. Indirect taxes account for 41% of all revenue, direct taxes for 28%, while 30% of all revenue is collected through social insurance contributions.

Table 5: Taxes and social contributions: overview (1998)

| | € million | all | GDP |
|---|---------------|--------------|-------------|
| direct taxes | 10 540 | 28.4 | 9.8 |
| of which: <i>personal income tax</i> | 4 768 | 12.7 | 4.4 |
| indirect taxes | 15 402 | 41.1 | 14.3 |
| of which: <i>value added tax</i> | 7 860 | 20.9 | 7.3 |
| social contributions | 11 637 | 30.4 | 10.8 |
| all taxes and social contributions | 37 579 | 100.0 | 34.9 |

Source: Ministry of Finance (1999) and Eurostat (2004).

1.2.1 *Direct vs. indirect taxation*

Unlike elsewhere in Europe, the direct/indirect tax mix in Greece clearly favours the latter. Direct taxation amounted to less than 10% of GDP in 1998. Personal income tax contributed €4,768 million, that is about one-eighth of all revenue or 4.4% of GDP. On the contrary, indirect taxation was more significant as a source of public finance. In 1998 indirect taxation receipts corresponded to over 14% of GDP. Value added tax contributed more than any other tax: €7,680 million in 1998, that is over one-fifth of all revenue or 7.3% of GDP.

1.2.2. *Social contributions*

Given the weight of social insurance in the institutional configuration of the welfare state, social contributions in Greece account for a considerable proportion of government revenue

(defined broadly for this propose). The relevant figure stood at about 12.1% of GDP in 1998.

Employer contributions² amounted to €5,298 million in 1998, while employee contributions to €4,681 million (4.9% and 4.3% of GDP respectively). A further €1,658 million was collected through social contributions paid by self-employed workers (including farmers), pensioners and others. This is shown in detail in Table 6.

Table 6: Receipts from social contributions (1998)

| | € million | % all | % GDP |
|---|---------------|-------------|--------------|
| employer <i>actual</i> social contributions | 5 298 | 14.1 | 4.9 |
| employee social contributions | 4 681 | 12.5 | 4.3 |
| self-employed workers SIC | 1 395 | 3.7 | 1.3 |
| pensioners and others SIC | 263 | 0.7 | 0.2 |
| all social contributions | 15 785 | 32.3 | 12.09 |

Note: Employers *imputed* social contributions are excluded.

Source: Eurostat (2004).

As explained earlier, social insurance in Greece is fragmented along occupational lines. The affiliation of contributors in 1998 is shown in Table 7.

Table 7: Social insurance affiliation of contributors (1998)

| | no. of contributors | % of all |
|---|---------------------|--------------|
| private sector employees | 1 949 978 | 46.4 |
| <i>IKA</i> | 1 855 000 | 44.2 |
| <i>seamen (NAT)</i> | 25 495 | 0.6 |
| <i>banking employees</i> | 27 885 | 0.7 |
| <i>press workers</i> | 12 947 | 0.3 |
| <i>other private sector workers</i> | 28 651 | 0.7 |
| public sector employees | 456 802 | 10.9 |
| <i>civil servants</i> | 375 211 | 8.9 |
| <i>Public enterprises</i> | 81 591 | 1.9 |
| self-employed | 1 019 853 | 24.3 |
| <i>own-account workers (OAAE)</i> | 750 044 | 17.9 |
| <i>lawyers, doctors & engineers</i> | 195 585 | 4.7 |
| <i>other self-employed workers</i> | 74 224 | 1.8 |
| farmers (<i>OFA</i>) | 774 546 | 18.4 |
| all contributors | 4 201 179 | 100.0 |

Source: Own elaboration of data derived from Ministry of Labour & Social Insurance (1998).

² Social protection receipts as defined by Eurostat distinguish between *actual* and *imputed* employers' social contributions. The figure shown here (€5,298 million) corresponds to actual contributions alone, which is the variable of interest. For the record, imputed employers' social contributions (such as maternity leave on full pay) were worth another €4,605 million in 1998.

2. Benefits and taxes / contributions simulated in EUROMOD

2.1. Social benefits

EUROMOD is a cross-country comparative benefit-tax model. The model simulates a variety of taxes and benefits in each of the 15 countries of the EU. The social benefits simulated for Greece include retirement and family benefits. Table 8 summarises how each of the social benefits analysed in section 1.1 is treated in EUROMOD.

Table 8: Treatment of benefits in EUROMOD (1998)

| | treatment | variable name |
|---|-----------|--------------------------------|
| <i>retirement benefits</i> | | |
| old age pensions ^a | read off | <i>grben_oa</i> |
| survivor pensions ^a | read off | <i>grben_su</i> |
| invalidity pensions ^{ab} | read off | <i>grben_si</i> |
| farmer basic pension | simulated | <i>gr_sben_oga_farmer</i> |
| social pension | simulated | <i>gr_sben_socpen</i> |
| pensioner social solidarity benefit | simulated | <i>gr_sben_socsolidarity</i> |
| <i>family benefits</i> | | |
| lifetime pension to many-children mothers ^{ac} | ... | ... |
| large family benefit | simulated | <i>gr_sben_cb_large_family</i> |
| 3rd child benefit | simulated | <i>gr_sben_cb_third</i> |
| unprotected child benefit | simulated | <i>gr_sben_cb_unprotected</i> |
| civil servant family allowance | simulated | <i>gr_sben_cs_cb</i> |
| ordinary family allowance | simulated | <i>gr_sben_cb</i> |
| <i>unemployment benefits^a</i> | read off | <i>grben_un</i> |
| <i>disability benefits^a</i> | read off | <i>grben_di</i> |
| <i>housing benefits^d</i> | ... | ... |

Note: ^a No information on contributions or other eligibility conditions is available in the original dataset.

^b The variable *grben_si* includes sickness benefits.

^c Recorded under “large family benefits” in the original dataset.

^d Housing benefits are not recorded in the original dataset.

EUROMOD is a *static* microsimulation model. As such, it is unable to simulate benefits that depend on a contributory record. Earnings-related social insurance pensions are the clearest example of such benefits³. Unemployment benefits and sickness benefits are not simulated because they are dependent on prior contributions, occupational status and other categorical conditions on which no information is available in the dataset. Non-contributory disability benefits are not simulated for a similar reason, as the ECHP dataset used contains no

³ Partial exceptions to this rule concern *OAEI* family allowances (since the contribution requirement in this case is minimal), civil service family allowances (where are classified as contributory only in a technical sense) and the pensioners’ social solidarity benefit *EKAΣ* (which limits eligibility to low-income pensioners already drawing a social insurance pension).

information on disability⁴. All these benefits are “read off” the original dataset.

On the contrary, it has been possible to simulate retirement benefits that are either flat-rate (*OΓA* basic pension and social pension) or related to current income (*EKAΣ*). Family benefits are also simulated, with the exception of lifetime pension to many-children mothers which is not simulated because no information on total number of children mothered by claimant (including those children no longer living with the family) is available in the original dataset. Lifetime pension is not recorded separately in the dataset, which implies that the relevant benefit may have been reported as large family benefit. Finally, housing benefits are not recorded at all in the original dataset for Greece.

Overall, the benefits simulated in EUROMOD accounted for a combined expenditure of over €1.671 million in 1998, that is 11% of all spending on social benefits or 1.55% of GDP.

2.1.1. *Farmer basic pension (gr_sben_oga_farmer)*

This is a non-contributory pension, awarded to men and women living in rural areas, aged 65 and over, not in receipt of another social insurance pension, who had been active for at least 25 years in agriculture or similar sectors (such as fishing).

Eligibility conditions

Everyone receiving *OΓA* farmer basic pension in the dataset (*benelig1_name=GROGAPNS*) is eligible⁵.

Income test

There is no income test.

Benefit amount

The base amount in 1998 was €93.78 per month, paid 14 times a year. Since EUROMOD assumes annual amounts to be equal to monthly amounts multiplied by 12, this is equivalised to €109.41 as if it were paid in 12 monthly instalments (*SingPay=109.4081*).

Supplements of €2.82 a month per dependant are also payable (see below). Supplements are calculated as a multiple of the base amount (*es_ch=0.03004*; *es_spouse_age1=0.03004*).

Definitions

Dependants are defined as:

- (a) spouse aged below 65, that is too young to qualify for a farmer basic pension of

⁴ In any case, given their great fragmentation, simulating disability benefits in Greece would have required extremely detailed information on type of disability, employment status etc.

⁵ As explained earlier, the dataset contains no information on employment history. Therefore, it cannot identify pensioners who had been active for at least 25 years in agriculture or similar sectors. The other conditions (aged 65 and over, not in receipt of another social insurance pension) were not checked. A small proportion of beneficiaries (less than 7%) were found to be aged less than 65, but this was allowed in view of the fact that recipients of widowhood, invalidity or orphan *OΓA* basic pension can be younger.

- her own right (*es_spouse_age1_max=64*),
- (b) children aged up to 18 or up to 22 if in full-time education (*TAX_UNIT=cb_family*).

2.1.2. Social pension (*gr_sben_socpen*)

This is a non-contributory, income-tested pension. It is reserved to people over 65 years of age, who are not in receipt of a contributory pension from a social insurance scheme and lack independent means of support.

Eligibility conditions

Beneficiaries must be over 65 (*ge_Age1_lt=65*), except if in receipt of a social insurance pension (*ge_inc_il=socpen_ex*, defined as *socpen_ex=grben_di, grben_oa, grben_si, grben_su*).

Income test

Benefit is granted if family income does not exceed the benefit amount itself⁶ (*select_il=socpen_means*).

Benefit amount

The social pension is set at the same amount as the *OIA* farmer basic pension.

The base amount in 1998 was €93.78 per month, paid 14 times a year. Since EUROMOD assumes annual amounts to be equal to monthly amounts multiplied by 12, this is equivalised to €109.41 as if it were paid in 12 monthly instalments (*SingPay=109.4081*).

Supplements of €2.82 a month per dependant are also payable (see below). Supplements are calculated as a multiple of the base amount (*es_ch=0.03004; es_spouse_age1=0.03004*).

Those above the income threshold are not eligible at all. That is, benefit is not withdrawn gradually as other income rises. In other words, benefit award is a binary variable: either the full amount is paid or no benefit at all.

Definitions

Family income assessed (*socpen_means*) includes all sources of gross income, with the only exception of irregular lump sum benefits (*colrRegY*) that are disregarded.

Dependants are defined as:

- (a) spouse aged below 65, that is too young to qualify for a social pension of her own right (*es_spouse_age1_max=64*),
- (b) children aged up to 18 or up to 22 if in full-time education (*TAX_UNIT=cb_family*).

⁶ Therefore, it is possible for one spouse to be eligible for social pension if the other spouse receives *OIA* farmer basic pension (same amount as social pension), provided he or she has no other income.

2.1.3. Pensioner social solidarity benefit (*gr_sben_socsolidarity*)

This benefit, known as *EKAΣ*, is an income-tested supplement aimed at recipients of old age and survivor pension over 60 or of invalidity pension irrespective of age. It is restricted to those receiving a contributory social insurance pension. *OFA* pensioners are excluded on the grounds that their pension is not contributory.

Eligibility conditions

Beneficiaries must be over 60 if in receipt of an old age pension (*benelig1_name=grben_oa; ge_age1_lt=60*) or a survivor pension (*benelig2_name=grben_su; ge_age2_lt=60*). There is no age condition if in receipt of an invalidity pension (*benelig3_name=grben_si*). Recipients of a farmer basic pension (*ge_var1_name=gr_sben_oga_farmer*) or a social pension (*ge_var2_name=gr_sben_socpen*) are excluded.

Income test

Three income concepts are assessed separately:

- (a) personal net income from retirement benefits and employment earnings,
- (b) personal income from all sources,
- (c) family income.

In 1998 the full rate was paid to those with annual incomes below:

- (a) €4,490
- (b) €5,758
- (c) €8,957 respectively⁷.

More specifically, the first income condition (personal net income from retirement benefits and employment earnings) is formulated as *ge_inc1_lt=4930.3008*, which is the threshold for access to the lowest rate of benefit (*case4_uplt_amount*). The personal income condition is *ge_inc2_lt=5757.887*, while the family income condition is *ge_tu_inc_lt=8956.7131*.

Benefit amount

The full rate of *EKAΣ* (€34.92 a month in 1998, paid 14 times a year) is paid to claimants with incomes below all thresholds. Since EUROMOD assumes annual amounts to be equal to monthly amounts multiplied by 12, the full rate is equivalised to €40.74 as if it were paid in 12 monthly instalments (*case1_amount=40.7434*).

Reduced rates are paid to those below the personal income and the family income threshold, but with personal net income from retirement benefits and employment earnings up to 10% above the relevant threshold.

⁷ Note that assessment is based on tax returns of the year before the application, for incomes earned two years before the application (that is the most recent year for which a tax return is available). Since information on past incomes is not incorporated in EUROMOD, the income conditions are treated as if they referred to incomes earned in the application year.

More specifically, benefit rates are as shown in Table 9.

Table 9: EKAΣ rates by net income from pensions and employment earnings (1998)

| income condition | | benefit rate (€ per month) |
|------------------------------------|------------------------------------|-------------------------------|
| lower bound (€ per year) | upper bound (€ per year) | |
| <i>case1_lolt_amount=0</i> | <i>case1_uplt_amount=4490.0953</i> | <i>case1_amount=40.7434</i> |
| <i>case2_lolt_amount=4490.0953</i> | <i>case2_uplt_amount=4666.1775</i> | <i>case2_amount=30.5746</i> |
| <i>case3_lolt_amount=4666.1775</i> | <i>case3_uplt_amount=4783.5656</i> | <i>case3_amount=20.4059</i> |
| <i>case4_lolt_amount=4783.5656</i> | <i>case4_uplt_amount=4930.3008</i> | <i>case4_amount=10.2030</i> |

Definitions

The income concept used for the first income condition (personal net income from retirement benefits and employment earnings) comprises social insurance pensions of all types except farmer basic pensions and social pensions ($penY=grben_oa+grben_si+grben_su$), as well as employment earnings ($coempY$).

The income concept used for the second (personal income from all sources) and third (total family income) conditions is the tax base ($gr_it_taxbase$). The tax base is defined as taxable income minus exemptions (self-employed and farmer social contributions plus the various tax allowances). This is analysed in section 2.2.3.

The tax unit for the family income condition is $ge_tu_inc_tu=cb_family$.

2.1.4. Large family benefit ($gr_sben_cb_large_family$)

This benefit is targeted to families with four or more children, provided that at least one of these is less than 22 years of age and still living at the parental home. Families with four or more children who are all grown up and independent are eligible for another benefit (lifetime pension to many-children mothers).

Eligibility conditions

Access to large family benefit is limited to families with at least four children, irrespective of their age⁸.

On the other hand, the amount of benefit paid is determined by the number of those children who are below 22 and not married nor cohabiting ($es_ch_age1_max=22$).

Income test

An income test determining access to large family benefit was introduced in 1997 (and was later abolished).

The annual income threshold⁹ in 1998 was €23,478 ($inc_lt=23477.6228$), increased by 10%

⁸ As a matter of fact, eligibility is not restricted to children living in the parental home, but the dataset provides no information on blood ties beyond a given household. In view of that, recipient numbers are expected *a priori* to be under-estimated.

⁹ See footnote 7.

per child after the fourth (*ch4_inc_lt=1467.3514*).

Benefit amount

The benefit rate in 1998 was €30.73 per month per eligible child, paid 12 times a year (*SingPay=30.7263*).

This is subject to a minimum benefit rate for the family as a whole. In 1998 the minimum rate was set at €67.50 (*SBEN_amt_min=67.4981*).

Families above the income threshold are not eligible at all. That is, benefit is not withdrawn gradually as other income rises. In other words, benefit award is a binary variable: either the full amount is paid or no benefit at all.

Definitions

The family comprises the head, his partner and their children irrespective of age (*TAX_UNIT = large_family*).

Family income as assessed (*emp_cb_third_means*) includes the benefit itself.

2.1.5. 3rd child benefit (gr_sben_cb_third)

This benefit is targeted to families with a third child aged 6 years or less.

Eligibility conditions

Access to 3rd child benefit is limited to families with three children (*ge_nch_lt=3; le_nch_lt=3*), of which at least one is aged 6 or younger (*ge_nch_age1_max=6*).

Income test

An income test for access to 3rd child benefit was introduced in 1997 and was abolished in 2002.

The annual income threshold¹⁰ in 1998 was €20,543. As a matter of fact, the income concept used for assessment included 3rd child benefit itself. In view of that, the relevant income test in the model is reduced by the amount of the benefit (*emp_cb_third_means=19068.0564*).

Benefit amount

The benefit rate in 1998 was €122.91 per month, paid 12 times a year (*SingPay=122.9053*).

Families above the income threshold are not eligible at all. That is, benefit is not withdrawn gradually as other income rises. In other words, benefit award is a binary variable: either the full amount is paid or no benefit at all.

¹⁰ See footnote 7.

Definitions

The family comprises the head, his partner and their children irrespective of age (*TAX_UNIT = large_family*).

The family income concept used for assessment (*emp_cb_third_means*) is the taxable income (*taxableY*).

2.1.6. Unprotected child benefit (gr_sben_cb_unprotected)

This non-contributory benefit is targeted to low-income single-parent families or low-income households comprising orphans born to relatives (i.e. foster families are not eligible).

Eligibility conditions

Since the dataset cannot identify households comprising orphans born to relatives, access to unprotected child benefit as operationalised here is limited to single-parent families alone (*IsLp1=1*).

Income test

The annual income threshold¹¹ in 1998 was €2,817 for a three-member family (*inc_lt = 234.7762* on a monthly basis).

The threshold is increased by €247 for each additional member beyond the first three (*pers3_inc_lt=20.5429* on a monthly basis).

Benefit amount

The benefit rate per eligible child in 1998 was set at €44.02 per month, paid 12 times a year (*SingPay=44.0205; es_ch=1*).

Families above the income threshold are not eligible at all. That is, benefit is not withdrawn gradually as other income rises. In other words, benefit award is a binary variable: either the full amount is paid or no benefit at all.

Definitions

Children are defined as individuals aged up to 18, or up to 22 if in full-time education (*TAX_UNIT=cb_family*).

The family income concept used for assessment (*emp_cb_means_disreg_rent*) excludes rent.

2.1.7. Civil servant family allowance (gr_sben_cs_cb)

This is a non-contributory benefit paid to all civil servants with children as an allowance (i.e. salary supplement).

¹¹ See footnote 7.

Eligibility conditions

Eligible are families where at least one parent is a civil servant (*IsCIVSRV=1*).

Income test

There is no income test.

Benefit amount

The amount of benefit rises with the number of children.

Benefit rates are shown in Table 10.

Table 10: Civil servant family allowance rates by number of children (1998)

| no. of children | benefit rate | |
|-----------------|--|--------------------------|
| | marginal increments as multiples of base rate (<i>SingPay=17.6082</i>) | € per month (cumulative) |
| 1 | <i>es_ch_parity1 = 1.0000</i> | 17.61 |
| 2 | <i>es_ch_parity2 = 1.0000</i> | 35.22 |
| 3 | <i>es_ch_parity3 = 2.0000</i> | 70.43 |
| 4 | <i>es_ch_parity4 = 2.6667</i> | 117.39 |
| 5 | <i>es_ch_parity5 = 4.1667</i> | 190.76 |
| 6 | <i>es_ch_parity6 = 4.1667</i> | 264.12 |

Note that the family allowance can be paid to both parents, if both are civil servants.

Definitions

Children are defined as individuals aged up to 18, or up to 22 if in full-time education (*TAX_UNIT=cb_family*).

2.1.8. Ordinary family allowance (gr_sben_cb)

This is a contributory benefit, known as *OAEA* family allowance, paid to families of private sector workers¹² with children. Unlike civil servant family allowance, it is not paid as salary supplement but has to be claimed separately.

Eligibility conditions

Eligible are families where at least one parent is a private sector employee (*IsEmployee1=1*), or a recipient of unemployment benefit (*benelig1=1; benelig1_name=grben_un*)¹³. Civil servants are not eligible (*IsCIVSRV=-1*).

¹² In fact, as a result of collective agreements, separate arrangements are in force in some sectors, for instance in banking, not simulated here.

¹³ Claimants must also have a rather minimal contributory record (at least 50 days in the previous year, unless in receipt of unemployment benefit or incapable of working because of illness or disability). This is ignored here.

Income test

In 1998 *OAEA* family allowance was still inversely related to family income (lower rates of benefit were paid to higher-income families), though since 1999 benefit has been paid at a flat rate to all beneficiaries irrespective of income.

Four annual income bounds applied:

- lower than €6,456
- higher than €6,456 lower than €7,337
- higher than €7,337 lower than €8,217 and
- higher than €8,217.

The income condition is defined as $le_inc1_il=emp_cb_means$ which is the income concept applied, and $le_inc1_lt=6456.3462$ which is the annual income threshold for access to the full rate of benefit.

Benefit amount

The amount of benefit within each income bound rose with the number of children. This is formulated by reference to a base rate for each income bound (i.e. $SingPay=4.7542$ for the lowest income bound) and to marginal increments for each child as multiples of the base rate (i.e. $es_ch_parity1 = 1.000$, $es_ch_parity2 = 2.432$ and so on for the lowest income bound).

Benefit rates are shown in Table 11.

Table 11: Ordinary family allowance by annual income and number of children (1998)

| income condition (€ per year) | | benefit rate (€ per month) | | | | |
|-------------------------------|-------------|----------------------------|------------|------------|------------|------------|
| lower bound | upper bound | 1 child | 2 children | 3 children | 4 children | 5 children |
| 0 | 6,456 | 4.75 | 16.32 | 35.39 | 41.97 | 49.30 |
| 6,456 | 7,337 | 3.84 | 12.82 | 33.54 | 39.47 | 46.81 |
| 7,337 | 8,217 | 3.29 | 10.62 | 30.02 | 33.78 | 41.12 |
| 8,217 | over | 3.29 | 10.62 | 20.13 | 28.11 | 35.45 |

Note: In 1998 the benefit rate increased by €7.34 per month for each child after the fifth.

Definitions

The income concept used for the income condition (annual family income) comprises **employment and self-employment earnings, other regular income, lump sum payments, private transfers and unemployment benefit** ($emp_cb_means=coempY+coslfemY+cootherY+columpY+coprvttrn+grben_un$).

The tax unit for the family income condition is *cb_family*. Children are defined as individuals aged up to 18, or up to 22 if in full-time education.

2.2. Personal income tax

The main tax simulated for Greece is personal income tax (*gr_it*). In 1998, all residents were required to file income tax returns if their annual income exceeded €1,174. A higher threshold applied for wage earners (€2,348) and farmers (€2,935), under certain conditions. Almost 4.6 million tax units on behalf of more than 9.4 million persons (including dependent children) filed a tax return in 1999 (i.e. for incomes earned in 1998). The coverage of personal income tax reached 87.4% of the entire population.

2.2.1. Tax unit

Personal income tax is individual. Spouses file a joint income tax return, but their incomes are entered separately and taxed individually (*TAX_UNIT=individual*).

However, as explained shortly, there is a partial exception to this rule: various tax allowances and/or tax credits are jointly assessed (*TAX_UNIT=cb_family_tax*). The tax unit for the joint assessment of tax allowances/credits is broader as it includes both spouses and any dependent children.

2.2.2. Tax allowances

Tax allowances are defined as exemptions from taxable income.

Five tax allowances are simulated here: (a) medical expenses tax allowance, (b) mortgage interest tax allowance, (c) education expenses tax allowance, (d) rent tax allowance and (e) private insurance contributions tax allowance.

2.2.2.1. Medical expenses tax allowance (*gr_it_med_ded*)

Medical expenses in 1998 could be exempted from taxable income in full up to the sum of €29,347 (*incomebase_il = taxableY; maximum for full deduction: Gr_maxded1=29347.028*). Any excess amount up to the sum of €44,021 could be exempted in half (*maximum for partial deduction: Gr_maxded2=44020.5429; rate for partial deduction: Gr_medded_rate=0.5*). No exemption could be allowed for the part exceeding €44,021.

More specifically, the exemption is calculated according to the rule shown in Table 12.

Table 12: Calculation of medical expenses tax allowance (1998)

| case no. | if: | | then : |
|----------|-----------------------|----------------------|---------------------------------|
| | taxable income (Y) | medical expenses (M) | exemption (E) |
| 1a | Y < €29,347 | M < Y | E = 100% M |
| 1b | | M > Y | E = 100% Y |
| 2a | €29,347 < Y < €44,021 | M < Y | E = €29,347 + 50% (M - €29,347) |
| 2b | | M > Y | E = €29,347 + 50% (Y - €29,347) |
| 3a | Y > €44,021 | M < €44,021 | E = €29,347 + 50% (M - €29,347) |
| 3b | | M > €44,021 | E = €36,684* |

Note: * E = €29,347 + 50% (€44,021 - €29,347) = €36,684

Note that this tax allowance is jointly assessed: individual medical expenses are summed up across all tax unit members. In the case of two-earner households, the resulting exemption is then reallocated to the spouses in proportion to their taxable income ($TAX_UNIT=cb_family_tax$)¹⁴.

The variable identifying medical expenditure ($medexp_var=grEXHLTH$) has been imputed on the basis of a procedure explained elsewhere¹⁵.

2.2.2.2. Mortgage interest tax allowance (co_morint)

The interest (not capital) repayments of housing loans taken out before 31 December 1999 could be fully exempted from taxable income.

The interest component of mortgage repayments depends on the exact type of housing loan, but is generally a decreasing function of time: in early years interest repayments are a higher proportion of total mortgage repayments than towards the end of the repayment period.

Since such detailed information is lacking, a simple method is applied in order to separate interest repayments from capital ones. As a rough approximation, the discriminating variable is the age of the head of the tax unit ($select_var=coAGE$).

More specifically, two cases are identified:

- If the head of the tax unit is aged up to 39 ($case1_uplt_amount=39$), interest payments are assumed to be 40% of total mortgage repayments ($case1_amount=0.4$).
- If the head of the tax unit is aged 40 or over ($case2_lolt_amount=40$), interest payments are 20% of total mortgage repayments ($case2_amount=0.2$).

The variable identifying mortgage repayments ($grMORT$), containing both interest and capital repayments, is then multiplied by the appropriate factor (stored in co_templ).

2.2.2.3. Education expenses tax allowance ($gr_it_tuition_ded$)

Expenses on private lessons or cramming school fees in 1998 were partly exempted from taxable income. The exemption was calculated as 40% of the amount spent ($number1=0.4$), subject to a maximum of €440 ($up_limit=440.2055$) **per family member, including children. The resulting amount is then deducted from the father's taxable income, or the mother's if the children are hers from a previous relationship.**

The variable identifying education expenditure ($var1=grExEduc$), imputed on the basis of a procedure explained elsewhere¹⁶, contains items that may not or may not be eligible for the tax allowance (such as, for instance, tuition fees at private schools). On the other hand, claims for the exemption of eligible items must be accompanied by the relevant receipts, which will not be available if the tuition in question is provided on a “moonlighting” basis (as is often the case with private lessons). For these reasons, as a rule of thumb only 50% of the variable value is assumed to be eligible for the tax allowance ($var1=grExEduc$; $number1=0.5$).

¹⁴ The procedure for sharing tax allowances between spouses is shown in module “ $co_share_var_il$ = sharing tax allowances between spouses” ($share_il_name=it_shared_allowances$; $prop_il_name=taxableY$; $output_var_name=gr_it_fam_ded$; $TAX_UNIT=couple$).

¹⁵ See O’Donoghue, Baldini & Mantovani (2001), discussed here in section 3.3.4.

¹⁶ See footnote 15.

2.2.2.4. Rent tax allowance (*gr_it_rent_ded*)

In 1998 rent was partly exempted from taxable income. The exemption was calculated as 30% of rent paid (*number1=0.3*), subject to a maximum of €704 (*up_limit=704.3286*) or 15% of taxable income, whichever is lowest. The variable identifying rent is read off the original data (*var1=coRent*).

Note that this tax allowance is jointly assessed: household expenditures on rent are allocated to tax-paying members in proportion to their taxable income (*TAX_UNIT=cb_family_tax*)¹⁷.

2.2.3. Tax base

The tax base (*gr_it_taxbase=ill-il2*) is defined as taxable income (*ill=taxableY*) minus the various exemptions (*il2=it_ded*).

Taxable income includes all sources of income. More specifically, the definition of taxable income is as follows:

$$\begin{aligned} \text{taxableY} = & \text{coempy} + \text{coinvy} + \text{coirregy} + \text{columpy} + \text{comainty} + \text{comatery} + \\ & \text{coothery} + \text{copropy} + \text{coprvpen} + \text{coregy} + \text{coslfemy} \text{ gr_sben_cb} + \text{gr_sben_cs_} \\ & \text{cb} + \text{gr_sben_oga_farmer} + \text{gr_sben_socpen} + \text{gr_sben_socsolidarity} + \text{grben_} \\ & \text{oa} + \text{grben_si} + \text{grben_su} + \text{grben_un} \end{aligned}$$

Exemptions from the tax base include social insurance contributions plus the tax allowances referred to above:

$$\begin{aligned} \text{it_ded} = & \text{gr_eesic} + \text{gr_cssic} + \text{gr_sesic} + \text{gr_frmsic} + \text{gr_pesic} + \text{co_morint} + \\ & \text{gr_it_med_ded} + \text{gr_it_tuition_ded} + \text{gr_it_rent_ded} \end{aligned}$$

2.2.4. Tax schedule

Income taxation is graduated, with progressively higher marginal tax rates applying to higher income brackets. The tax schedule in 1998 included 6 such brackets. This is shown in Table 13.

Table 13: Tax schedule: general case (1998)

| tax band no. | income bracket (€ per annum) | | tax rate (%) |
|--------------|------------------------------|-------------|--------------|
| | lower limit | upper limit | |
| 1 | 0 | 3,096 | 0 |
| 2 | 3,096 | 7,740 | 5 |
| 3 | 7,740 | 12,384 | 15 |
| 4 | 12,384 | 21,673 | 30 |
| 5 | 21,673 | 46,443 | 40 |
| 6 | 46,443 | over | 45 |

In the case of tax payers with income from employment earnings and/or retirement benefits alone, the upper limit to tax band 1 could be extended by up to €880 per annum (*emp_pen_*

¹⁷ See footnote 14.

$band1_add = 880.4108$; $pen_emp_il = pen_emp$; $pen_emp = coempy + grben_di + grben_oa + grben_si + grben_su + grben_un$)¹⁸.

The resulting tax schedule is shown in Table 14.

Table 14: Tax schedule: employees and pensioners (1998)

| tax band no. | income bracket (€ per annum) | | tax rate (%) |
|--------------|------------------------------|-------------|--------------|
| | lower limit | upper limit | |
| 1 | 0 | 3,977 | 0 |
| 2 | 3,977 | 7,740 | 5 |
| 3 | 7,740 | 12,384 | 15 |
| 4 | 12,384 | 21,673 | 30 |
| 5 | 21,673 | 46,443 | 40 |
| 6 | 46,443 | over | 45 |

2.2.5. Tax credits

Tax credits are defined as deductions from tax due. Three such instruments are simulated here: (i) child tax credit, (ii) private insurance contributions tax credit, and (iii) household expenses tax credit. In the case of two-earner households, the tax credits are allocated to the spouses in proportion to their taxable income ($TAX_UNIT = cb_family_tax$)¹⁹.

Note that these tax credits are non-refundable. In other words, final tax is calculated as the amount of tax resulting from the tax schedule ($cosim_polout$) minus the sum of all tax credits ($co_it_total_tcred$), subject to a minimum of 0 ($lo_limit_amount = 0$).

2.2.5.1. Child tax credit

The per-child value of the tax credit is a positive function of the number of children in the tax unit. This is shown in Table 15 below.

Table 15: Child tax credit (1998)

| no. of children | child tax credit | |
|---------------------|-------------------------|----------------------------|
| | per child (€ per annum) | per tax unit (€ per annum) |
| case1_lolt_amount=0 | case1_amount=0 | 0 |
| case2_lolt_amount=1 | case2_amount=73.3675 | 73 |
| case3_lolt_amount=2 | case3_amount=73.3675 | 147 |
| case4_lolt_amount=3 | case4_amount=102.7146 | 308 |
| case5_lolt_amount=4 | case5_amount=132.0616 | 528 |

Note: In 1998 the annual amount of the child tax credit for families with four or more children was €132 per child.

¹⁸ The justification for this seems to be the perceived need to compensate employees and pensioners for the fact that other categories of tax payers (e.g. the self-employed) are widely believed to understate their true incomes in order to evade tax.

¹⁹ The procedure for sharing tax credits between spouses is shown in module “ $co_share_var_il =$ sharing tax credits between spouses” ($share_il_name = it_shared_tc$; $prop_il_name = taxableY$; $output_var_name = co_it_total_tcred$; $TAX_UNIT = couple$).

2.2.5.2. Private insurance contributions tax credit (*gr_it_priv_contrib_ded*)

According to the tax rules in force in 1998, the private insurance contributions tax credit is calculated as follows:

- First, private insurance contributions are identified from a relevant variable list (*ill=priv_contrib; priv_contrib = coPENCON + grMEDINS*), subject to a maximum of €587 or 4% of taxable income, whichever is lowest.
- Then, the tax credit is derived by multiplying eligible expenses by the marginal tax rate applicable (*gr_it_mitr*), subject to a maximum marginal tax rate of 15%, which results to a maximum tax credit of €88 (*up_limit=88.04109*).

2.2.5.3. Household expenses tax credit (*gr_it_household_exp_tcred*)

According to the tax rules in force in 1998, the household expenses tax credit is calculated as follows:

- First, total household expenses are identified from a relevant variable list (*ill=hh_exp; hh_exp = grEXCLFT + grEXHOUS + grEXLEIS + grEXOTHR + grEXREST*), subject to a maximum of €2,935.
- Then, eligible expenses are derived by multiplying total household expenses by a factor of 30% (*number1=0.3*), subject to a maximum of €880 (*up_limit=880.4109*).
- Finally, the tax credit is derived by multiplying eligible expenses by the marginal tax rate applicable (*gr_it_mitr*), subject to a maximum marginal tax rate of 15% – that is a maximum tax credit of €132 (*up_limit=132.0616*).

2.2.6. Withholding tax on benefits (*gr_benit*)

Certain benefits are taxed at source at 10% plus 1.2% stamp duty. When, after the financial year is over, beneficiaries file a tax return, they can choose either to have their benefits taxed as normal income, or to “have their liability exhausted with the tax already withheld”. In the former case, the 10% tax deducted at source (not the stamp duty) will be assessed against tax due. In the latter case, benefits will be taxed at a flat rate of 10% + 1.2%.

In theory, the rule means that rational taxpayers have benefits taxed as income only when their marginal tax rate is below 10%. In practice, few tax payers enter income from certain benefits in their tax return.

In view of the above, the withholding tax on benefits (*gr_benit*) is assumed to apply to the following benefits alone (*number1=0.112; ill=bentaxbase*):

- large family benefit (*gr_sben_cb_large_family*)
- 3rd child benefit (*gr_sben_cb_third*)
- unprotected child benefit (*gr_sben_cb_unprotected*)
- disability benefits (*grben_di*).

By contrast, all other benefits are assumed to be taxed as normal income.

2.3. Social contributions

Social contributions are paid by all members of social insurance organisations, whether active or retired. As elsewhere in continental Europe, membership of a social insurance organisation is compulsory.

Social insurance in Greece, as explained earlier, is highly fragmented, with contribution rates varying considerably between (and, sometimes, within) social insurance organisations. In view of that, attempting to simulate all possible cases would be rather futile (and, probably, superfluous).

Instead, each contributor category is represented by the largest social insurance organisation for that category. This is shown in Table 16.

Table 16: Social contributions simulated (1998)

| contributor category | rules simulated | variable name | coverage (%) |
|--------------------------|---------------------------------|------------------|--------------|
| private sector employees | <i>IKA</i> | <i>gr_eesic</i> | 95.1 |
| public sector employees | <i>civil servants insurance</i> | <i>gr_csrsic</i> | 82.1 |
| self-employed | <i>TEBE</i> | <i>gr_sesic</i> | 53.0 |
| farmers | <i>OFA</i> | <i>gr_frmsic</i> | 100.0 |
| all contributors | | | 84.4 |

Moreover, pensioner social contributions are also applied (*gr_pesic*), while the rules of *IKA* are used to simulate employer social contributions (*gr_ersic*).

2.3.1. Employee social contributions (*gr_eesic*)

Workers insured with *IKA* (95.1% of all private sector employees in 1998) pay social contributions at a flat rate of 15.9% ($rate=0.159$) of reference earnings ($incomebase_{il}=coEMPY$). Here, as explained above, *IKA* contribution rules are applied to the entire sample of private sector employees. This sample excludes civil servants and other public sector workers ($exclude_{civsrv}=1$), as these are covered by a separate scheme.

Occupations that are officially classified as “hazardous” are subject to extra contributions at 3.45% of earnings ($add_rate=0.0345$). Workers in “hazardous” occupations are identified by a special variable ($add_rate_var=grHAZ$). This is discussed in section 3.3.4.1.

An upper earnings threshold of €1,501 in 1998 ($upper_limit_contrib=1501.1592$) applies to those first employed before 31 December 1992, while later entrants to the labour market have to pay contributions on their full earnings. In order to operationalise this, a variable has been created (*grYEARSINWRK*) to restrict eligibility for the contribution ceiling to those with 9 or more years in employment ($upper_limit_y_in_wrk=9$).

2.3.2. Employer social contributions (*gr_ersic*)

Employer contributions on behalf of workers insured with *IKA* are set at 28.16% of reference earnings ($rate=0.2816$). *IKA* contribution rules are applied to all private sector employees. The sample of workers on behalf of which employer contributions are paid is the same as for employee social contributions (*gr_eesic*). “Hazardous” occupations are subject to additional employer contributions at 2.15% of earnings ($add_rate=0.0215$).

As explained above, a contribution ceiling (for earnings over €1,501 in 1998) applies to those first employed before 31 December 1992 (*upper_limit_contrib=1501.1592*). Later entrants to the labour market have to pay contributions on their full earnings. A variable has been created (*grYEARSINWRK*) to restrict eligibility to those with 9 or more years in employment (*upper_limit_y_in_wrk=9*).

Private sector social contributions, based on *IKA* rules, for both employees and employers are analysed as shown in Table 17 below.

Table 17: Social contributions: private sector employees (1998)

| social insurance contributions (SIC) paid for: | contributions due as % of reference earnings | |
|---|--|------------------------------|
| | employee (<i>gr_eesic</i>) | employer (<i>gr_ersic</i>) |
| case 1: general regime | | |
| primary pension | 6.67 | 13.33 |
| supplementary pension | 3.00 | 3.00 |
| sickness insurance | 2.55 | 5.10 |
| unemployment insurance | 1.00 | 2.00 |
| family benefits | 1.00 | 1.00 |
| other benefits | 1.68 | 3.73 |
| total SIC: general regime | 15.90 | 28.16 |
| case 2: hazardous occupations | | |
| primary pension | 2.20 | 1.40 |
| supplementary pension | 1.25 | 0.75 |
| extra SIC: hazardous occupations | 3.45 | 2.15 |
| total SIC: hazardous occupations | 19.35 | 30.31 |

2.3.3. Civil servants social contributions (*gr_csrsic*)

Civil servants (82.1% of all public sector employees) pay social contributions at a flat rate of 16.22% (*rate1=0.1622*) of reference earnings (*base_il=coEMPY*). As explained earlier, civil service contribution rules are applied to all public sector employees. Civil servants are identified through a variable in the original dataset (*coCIVSRV; IsCivSrv=1*).

Social contributions of public sector workers, as proxied by civil servants, are analysed in Table 18 below.

Table 18: Social contributions: public sector employees (1998)

| social insurance contributions (SIC) paid for: | employee contributions (<i>gr_cvsic</i>) due as % of reference earnings |
|--|--|
| primary pension | 6.67 |
| supplementary pension | 5.00 |
| sickness insurance | 2.55 |
| separation benefits | 2.00 |
| total SIC | 16.22 |

2.3.4. Self-employed social contributions (*gr_sesic*)

Social contributions of self-employed persons not in agriculture are simulated on the basis of *TEBE* (the largest social insurance organisation in this category insuring 53.0% of all self-

employed workers outside agriculture in 1998).

Since reference earnings are not known in advance in the case of self employment, social contributions are set at fixed amounts per “insurance class”, according to a schedule revised annually. In *TEBE* there are 10 insurance classes for those first employed before 31 December 1992 plus another 5 for later entrants to the labour market.

Self-employed social contributions, based on *TEBE* rules, are shown in Table 19 below.

Table 19: Social contributions: self-employed workers (1998)

| insurance class (<i>grTEBEclass</i>) | contributions due (€ per annum) | | |
|---|---------------------------------|--------------------|-------|
| | pension insurance | sickness insurance | total |
| case 1: contributors to the “old” regime | | | |
| A | 298 | 399 | 697 |
| B | 411 | 403 | 813 |
| C | 530 | 445 | 975 |
| D | 659 | 472 | 1,130 |
| E | 880 | 514 | 1,395 |
| F | 1,004 | 539 | 1,542 |
| G | 1,243 | 602 | 1,845 |
| H | 1,800 | 637 | 2,437 |
| I | 2,328 | 644 | 2,972 |
| J | 2,856 | 648 | 3,504 |
| case 2: contributors to the “new” regime | | | |
| 1 | 783 | 428 | 1,210 |
| 2 | 962 | 526 | 1,488 |
| 3 | 1,630 | 623 | 2,253 |
| 4 | 1,884 | 721 | 2,605 |
| 5 | 2,128 | 814 | 2,942 |

Note: “Old” contributors were first employed before 31 December 1992.

“New” contributors were first employed after 1 January 1993.

On joining *TEBE*, contributors to the “old” regime (i.e. those already active on 31 December 1992) are allocated to insurance class E. After a year they move to insurance class F and after another five years to insurance class G. In 1998, 96.8% of all old members were in classes E, F or G.

Similarly, contributors to the “new” regime (i.e. those first employed after 1 January 1993) are allocated to insurance class 1. Every two years they move up one class, until they reach insurance class 5 where they can remain until retirement. In 1998, 99.8% of all new members were in classes 1,2 or 3.

The procedure for allocating contributors to insurance classes is explained in section 3.3.4.2.

2.3.5. Farmer social contributions (*gr_frmsic*)

Persons active in agriculture and related occupations such as fishing, as well as those active in other sectors but resident in rural areas – defined as settlements with a population below 2,000 inhabitants – are all insured with *OΓA*.

Until recently *OΓA* mostly provided non-contributory benefits, such as farmer basic pensions.

Since 1998 it has developed into a social insurance organisation, collecting contributions and providing contributory benefits, such as new farmer main pensions gradually introduced in the same year.

The most typical unit of the agricultural economy in Greece is the small family farm. As a consequence of that, although some *OFA* members are employees, most are self-employed. In view of that, contributions are defined in proportion to a “theoretical income” in 7 insurance classes, revised annually. The amount of social contributions corresponding to each insurance class was set at approximately 8.5% of theoretical income in 1998 (7% for pension insurance plus 1.5% for sickness insurance).

Contributors can choose insurance class freely. In 1998, 72.6% of contributors were found in class 1, about 6.5% each in classes 2 and 3, and 8% in class 7. The procedure for identifying farmers and for allocating contributors to insurance classes is explained in section 3.3.4.3.

Farmer social contributions are shown in Table 20 below.

Table 20: Social contributions: farmers (1998)

| insurance class (<i>grFrmIncOrder</i>) | theoretical income (€ per annum) | contributions due (€ per annum) | | |
|---|-------------------------------------|---------------------------------|----------|-------|
| | | pension | sickness | total |
| 1 | 3,381 | 237 | 51 | 287 |
| 2 | 4,191 | 293 | 63 | 356 |
| 3 | 5,043 | 353 | 76 | 429 |
| 4 | 6,223 | 436 | 93 | 529 |
| 5 | 7,406 | 518 | 111 | 630 |
| 6 | 8,589 | 601 | 129 | 730 |
| 7 | 9,769 | 684 | 147 | 830 |

2.3.6. Pensioner social contributions (*gr_pesic*)

Pensioner social contributions are levied at a flat rate of 4% ($rate1=0.04$) of pension income ($base_il = grben_oa + grben_su + grben_si + gr_sben_oga_farmer + gr_sben_socpen$). Such contributions pay for sickness insurance and are deducted at source.

3. The data

3.1. General description

The database used here is the Greek sample of the European Community Household Panel (ECHP), a survey designed by Eurostat and carried out by the National Statistical Service of Greece (*ΕΣΥΕ*). The datafile used is the User Database (UDB), provided by Eurostat.

The information available in the database is drawn from a representative sample of the Greek population. All members of participating households are interviewed in detail if aged 16 or more. The database contains detailed information on income, housing and other demographic, social and economic characteristics of the respondents. The information available for children (individuals below the age of 16) is restricted to demographic characteristics – such as age, gender and relation to the other household members.

The baseline information used in the model has been derived from ECHP wave 3 (year 1996). As is the case with all ECHP waves, the incomes reported in that survey referred to the year before (1995). In order to reconcile income and labour status information, employment and occupation variables were taken from ECHP wave 2 (year 1995).

3.2. Sample selection / weighting

The original ECHP wave 3 contained 15,183 members of 5,214 households. Of these, 121 individuals in 46 households reported zero incomes from all sources. These households were excluded from EUROMOD input data. As a result, the sample used in the model numbers 15,062 individuals in 5,168 households.

The weights provided by the ECHP are household weights aiming to correct for selective non-response and panel attrition. In EUROMOD these weights have been scaled up to offset the exclusion of 121 individuals in 46 households from the original sample. No reweighting was performed. Sample statistics and output estimates were projected to a reference population of 10,542,100 individuals in 3,720,085 households. Population estimates were provided by the National Statistical Service of Greece on the basis of the 1991 Population Census.

3.3. Data adjustment

This section summarises the most important adjustments performed to make data suitable for the purposes of EUROMOD.

3.3.1. Net-to-gross conversion

The income information available in the survey is net of income tax withholdings and social insurance contributions. In order to obtain gross figures, a procedure has been developed *ad hoc*, taking into account current legislation on income tax withholdings and social insurance contributions. This procedure is explained in length elsewhere²⁰.

²⁰ See Immervoll & O'Donoghue (2001).

3.3.2. Splitting benefits

The ECHP has not been designed to reflect the social benefit system of any one country. It may therefore be the case that some variables in the UDB correspond to more social benefits each. This aggregation, though inevitable, remains a limitation for the purposes of simulating any particular benefit system in detail.

This is the case with the variable PI134 (social benefits / sickness and invalidity) in the ECHP for Greece. As defined in the original dataset, this variable covers a very heterogeneous mix of policy instruments, such as contributory invalidity pensions and sickness benefits as well as non-contributory disability benefits.

In view of that, a cut-off point in the original dataset was taken to split variable PI134 into two:

- (a) contributory invalidity pensions or sickness benefits (*grben_si*) and
- (b) non-contributory disability benefits (*grben_di*).

The choice of cut-off point (drs. 27,800 in 1995), as is always the case, was partly arbitrary. It was based on the observation that no invalidity pension was below the cut-off, while the number of those receiving disability benefit at a *higher* rate than the cut-off was less than 16,800 persons in all (0.16% of population).

In 1998, the median monthly value of *grben_si* was €244.95, while the median monthly value of *grben_di* was €112.51. Appropriate adjustments were made to account for the fact that the former is paid 14 times a year, while the latter only 12.

3.3.3. Expenditure

As the ECHP is an income survey, it contains no information on household expenditure. Such information, however, is necessary for the simulation of tax allowances discussed in section 2.2.2. The imputation of expenditure variables has been carried out according to a procedure developed *ad hoc* for the purposes of the EUROMOD model. This procedure is explained in detail elsewhere²¹.

3.3.4. Contributors

As explained earlier (section 1), in Greece the benefit entitlements and social contributions of any given individual depend considerably on his or her social insurance affiliation. However, the original dataset contains no such information. As a consequence of that, contributors had to be somehow allocated to social insurance organisations – and, in some cases, to particular categories within organisations. The problem was particularly acute in the case of workers in “hazardous” occupations (*IKA*), the self-employed outside agriculture (*TEBE*) and farmers (*OIA*).

3.3.4.1. Hazardous occupations (*grHAZ*)

About 40% of all *IKA* contributors work in occupations officially designated as “hazardous”. They have the right to retire on a full pension up to 5 years before others. On the other hand,

²¹ See O’Donoghue, Baldini & Mantovani (2001).

as explained in section 2.3.1, they pay social contributions at a higher rate. It is for this reason that identifying those contributors is important for the purposes of modelling the benefit-tax system of Greece.

The following conditions were specified to identify workers in “hazardous” occupations:

- employment status must be “employee” ($coEmpSt=3$) and
- occupation must be “technician or associate professional” ($coOcc=3$) or “craft or trades worker” ($coOcc=7$) or “plant or machine operator” ($coOcc=8$) or
- occupation must be “skilled agricultural” ($coOcc=6$) or “elementary occupation” ($coOcc=9$), except when industry is “agriculture” ($coIndust=1$ was excluded).

3.3.4.2. Self-employed (gr_sesic)

Self-employed contributors were identified as individuals satisfying the following conditions:

- employment status must be “employer or self-employed” ($coEmpSt=2$),
- income from self-employment must be non-zero ($coSlfEmY>0$) and
- contributions paid to farmers social insurance must be zero ($gr_frmsic=0$).

The last condition excludes farmers (see section 3.3.4.3).

Furthermore, as explained in section 2.3.4, it was assumed that all those identified as self-employed except farmers were contributors to *TEBE* (53.0% of that category really were in 1998).

Before the contributions of those identified as contributors could be modelled, two issues had to be resolved: firstly, how to identify contributors to the “old” regime (i.e. those first insured before 31 December 1992) from contributors to the “new” regime (i.e. those first insured after 1 January 1993); secondly, how to assign contributors to insurance classes.

In order to resolve the first issue, a new variable was constructed ($years_working$), showing the year difference between an individual’s current age and the earliest age at which he or she could have entered the labour market. The latter was set equal to:

- 22 (females) / 24 (males) for those with tertiary education,
- 18 (females) / 20 (males) for those with upper secondary education,
- 16 (females) / 18 (males) for those with elementary or lower secondary education.

In other words, the possibility of someone starting work before finishing school or college was dismissed. Moreover, the earliest age for entering the labour market was postponed by two years in the case of males to account for compulsory military service.

If the year difference between an individual’s current age and the earliest age at which he or she could have entered the labour market was negative or zero, the value of the new variable ($years_working$) was set equal to 1.

With a view to resolving the second issue, the resulting values of the new variable were used to allocate *TEBE* contributors between the “new” and the “old” contribution regimes. More specifically, to match the actual distribution of *TEBE* contributors, the lowest 17.7% with respect to the distribution of $years_working$ were classified as contributors to the new regime, while the remaining 82.3% were classified as contributors to the old regime.

Finally, self-employment earnings (*coSlfEmY*) were used to allocate contributors to insurance classes. To mimic the quasi-proportional effect intended, the higher one's earnings the higher his or her insurance classes. Income brackets were chosen so that the resulting distribution of contributors between insurance classes matched the actual one, shown in Table 21.

Table 21: Distribution of *TEBE* contributors by insurance class (1998)

| insurance class (<i>grTEBEclass</i>) | no. of contributors | % |
|---|---------------------|-------|
| "old" contributors | | |
| A | 3 | 0.0 |
| B | 33 | 0.0 |
| C | 87 | 0.0 |
| D | 127 | 0.0 |
| E | 30,665 | 5.8 |
| F | 116,231 | 21.8 |
| G | 277,383 | 52.1 |
| H | 5,336 | 1.0 |
| I | 2,129 | 0.4 |
| J | 6,365 | 1.2 |
| total "old" contributors | 438,359 | 82.3 |
| "new" contributors | | |
| 1 | 51,348 | 9.6 |
| 2 | 26,752 | 5.0 |
| 3 | 15,904 | 3.0 |
| 4 | 136 | 0.0 |
| 5 | 16 | 0.0 |
| total "new" contributors | 94,156 | 17.7 |
| all contributors | 532,515 | 100.0 |

Contribution rates by insurance class were shown earlier in Table 19.

3.3.4.3. Farmers (*gr_frmsic*)

Firstly, farmers had to be identified. All individuals satisfying the following condition were designated as farmers:

- industry must be "agriculture" (*coIndust=1*) and
- employment status must be "employer or self-employed" (*coEmpSt=2*) or "employee" (*coEmpSt=3*) or employment status must be "other"²² (*coEmpSt=9*).

Secondly, contributors had to be selected among those identified as farmers. According to *OFA* rules, although membership of the new main pension scheme instituted in 1998 is compulsory for the head of a farming household, it is optional for secondary workers (typically, wives). In view of the fact that many wives actually did choose to participate, both spouses were selected as contributors if family income was below a multiple of 2.5 times the

²² The employment status of wives or sons/daughters working in the family farm may be classified as "other".

lowest rate of social contributions²³ (*gr_frmsic*).

Thirdly, contributors had to be allocated to insurance classes. As explained in section 2.3.5, farmer social contributions are related to a “theoretical income”. However, precisely because that income is theoretical, contributors are free to choose which of the 7 insurance classes to join. Since the actual distribution of *OFA* contributors by insurance class is known, in the model contributors were allocated to each insurance class according to their income.

More specifically, a new variable (*grFrmIncOrder*) was created to group contributors into the 7 insurance classes. The variable ranked individuals by income (*coEmpY+coSlfEmY*). In each group, the number of contributors was chosen to correspond to the actual distribution of *OFA* contributors shown in Table 22.

Table 22: Distribution of *OFA* contributors by insurance class (1998)

| insurance class (<i>grFrmIncOrder</i>) | no. of contributors | % |
|---|---------------------|-------|
| 1 | 545,487 | 72.6 |
| 2 | 48,188 | 6.4 |
| 3 | 49,691 | 6.6 |
| 4 | 26,389 | 3.5 |
| 5 | 15,530 | 2.1 |
| 6 | 5,692 | 0.8 |
| 7 | 60,364 | 8.0 |
| all contributors | 751,341 | 100.0 |

In other words, the 72.6% of contributors with the lowest income were allocated to insurance class 1, the next 6.4% to insurance class 2 and so on, up to the 8.0% of contributors with the highest income, allocated to insurance class 7.

3.4. Updating

The dataset used for Greece derives from the 1995 European Community Household Panel (ECHP). Employment earnings and social benefit data have been updated to the year 1998 on the basis of appropriate adjustment factors by income source. No account was taken of other economic, social and demographic changes taking place between 1995 and 1998.

The adjustment factors used are shown in Table 23 on the following page.

²³ The purpose of that is to avoid negative disposable family incomes. Note that individual net incomes can be negative (for example when the farmer’s wife pays contributions even though she has no income of her own).

Table 23: Uprating factors (1995 to 1998)

| income source | uprating factor |
|--|-----------------|
| employment incomes | |
| gross earnings of public sector employees | 1.424 |
| gross earnings of private sector employees outside banking | 1.252 |
| gross earnings of banking employees | 1.294 |
| gross earnings from self-employment (university degree) | 1.398 |
| gross earnings from self-employment (other) | 1.371 |
| non-simulated benefits | |
| old age pensions (<i>grben_oa</i>) | 1.252 |
| invalidity pensions (<i>grben_si</i>) | 1.252 |
| non-contributory disability benefits (<i>grben_di</i>) | 1.511 |
| unemployment benefit (<i>grben_un</i>) | 1.210 |
| simulated benefits | |
| pensioner social solidarity benefit (<i>gr_sben_socsolidarity</i>) | 1.000 |
| farmer pension (<i>gr_sben_oga_farmer</i>) | 1.278 |
| social pension (<i>gr_sben_socpen</i>) | 1.278 |

Source: Bank of Greece (2002) and own elaboration of data collected from social insurance organisations and other benefit agencies.

4. Validation

EUROMOD is validated against three types of sources.

The first source is official statistics. This information permits one to contrast results obtained from the EUROMOD baseline against publicly available statistics provided by official agencies. This feature is drawn upon in section 4.1 where *policy instruments* are validated.

The second source is the European Community Household Panel wave 6 (survey year 1999, incomes earned in 1998). As explained in section 3.1, the EUROMOD module for Greece relies on the ECHP database in the first place. However, rather than reading household disposable income off the original data, EUROMOD recalculates it by simulating certain taxes and benefits.

The third source is the Household Budget Survey undertaken in 1998/99 by the National Statistical Service of Greece (*EΣΥΕ*). The second and third features are drawn upon in section 4.2 where *distributive outcomes* are validated.

4.1. Policy instruments

The performance of the EUROMOD baseline is evaluated against official statistics on social benefits, personal income tax and social contributions.

4.1.1. Social benefits

Social benefits are validated separately with respect to recipient numbers, followed by a comparison of aggregate expenditure figures.

Table 24 on the following page shows recipient numbers with respect to social benefits, whether simulated or not.

To start with, EUROMOD overestimates the number of farmer basic pension recipients by about 9%. More seriously, the persons actually in receipt of social pension are 39% fewer than estimated by the model. Finally, EUROMOD overstates the number of pensioner social solidarity benefit (*EKAΣ*) recipients by a factor of 0.64. Given that social pension and pensioner social solidarity benefit are both income-tested, the discrepancy between model-derived estimates and administrative figures could be attributed to targeting errors. If this is the case, it would appear that social pension suffered from massive “leakages” (award of benefit to illegitimate recipients), while *EKAΣ* suffered from equally massive “non-take up” (no award of benefit to legitimate recipients).

While such possibility cannot be excluded *a priori*, a degree of caution seems advisable when interpreting these results, since reporting errors are far from common at the extremes of the income scale and among survey respondents of an advanced age.

Large variations between administrative figures and model estimates can be observed in the case of family benefits.

As explained in section 2.1.4, large family benefit is awarded to mothers according to the number of children they have given birth to, irrespective of whether the children remain in the parental home or not, provided that at least one of them does. Given that income surveys like

the ECHP collect no information on the family ties linking individuals who are members of different households, it can be no surprise that EUROMOD grossly underestimates recipients of large family benefit.

The fact that more families claim 3rd child benefit than EUROMOD estimates suggests the presence of some degree of “leakage”. However, this may be partly due to the way the income test for access to benefits is interpreted in the model vs. administrative practice. In real life, assessment of applications to 3rd child benefit in 1998 was based on tax returns from the year 1997 for incomes earned in 1996. Since information on past incomes is not incorporated in EUROMOD, the income conditions are treated as if they referred to incomes earned in the application year. It ought to be noted that this problem is not unique to 3rd child benefit, but applies equally to all income-tested benefits.

In view of the low value and poor administration of unprotected child benefit, the possibility of low take up suggested by administrative figures compared to EUROMOD estimates cannot be easily discounted.

Finally, the model seems to overestimate significantly the number of recipients of both family allowances simulated. The reason for this is quite simple: a multiplicity of schemes actually operate at sector (i.e. in banking) or company level (i.e. in public utilities), while EUROMOD simulates ordinary family allowance and civil servant family allowance as if they covered all private and all public sector workers respectively.

It should also be added that the model estimates the number of children receiving none of the family benefits at 794,000 (33.1% of all children). This estimate cannot be “validated” as no such estimate is available from other sources.

Table 24: Recipients of social benefits (1998)

| | EUROMOD estimates | administrative data | ratio |
|--|----------------------|------------------------|-------------|
| farmer basic pension | 665,917 | 608,433 | 1.09 |
| social pension | 21,124 | 34,657 | 0.61 |
| pensioner social solidarity benefit | 556,160 | 338,584 | 1.64 |
| simulated retirement benefits | 1,243,201 | 981,674 | 1.27 |
| large family benefit | 22,141 | 89,793 | 0.25 |
| 3rd child benefit | 31,302 | 45,227 | 0.69 |
| unprotected child benefit | 42,478 | 32,582 | 1.30 |
| civil servant family allowance | 436,858 | 208,350 | 2.10 |
| ordinary family allowance | 560,049 | 297,532 | 1.88 |
| simulated family benefits | 1,092,828 | 673,484 | 1.62 |
| old age pensions | 1,172,520 | 746,336 | 1.57 |
| survivor pensions | 335,260 | 324,020 | 1.03 |
| invalidity pensions | 85,205 | 363,819 | 0.23 |
| non-simulated retirement benefits | 1,592,985 | 1,434,175 | 1.11 |
| unemployment benefits | 154,607 | 374,095 | 0.41 |
| disability benefits | 37,545 | 104,160 | 0.36 |
| other non-simulated benefits | 192,152 | 478,255 | 0.40 |
| all benefits | 4,121,165 | 3,567,588 | 1.16 |

Note: Ministry of Labour & Social Insurance (2001) and own elaboration of data collected from social insurance organisations and other benefit agencies.

With respect to non-simulated retirement benefits, the model seems to overstate the number of recipients of old age pensions by 57%. However, this is partly offset by an underestimation of invalidity pension recipients²⁴. The number of survivor pension recipients is quite faithfully reproduced by EUROMOD.

As a matter of fact, taking all pensions together²⁵ (irrespective of whether simulated or not) reduces the distance between EUROMOD and official statistics: the total number of recipients of all retirement benefits was 2,280,000 as estimated by EUROMOD against 2,077,000 as indicated by administrative sources²⁶, that is an overestimate of 10%.

Table 25: Expenditure on social benefits (1998)

| | EUROMOD estimates | administrative data | ratio |
|--|----------------------|------------------------|-------------|
| farmer basic pension ^a | 877 | 820 | 1.07 |
| social pension | 28 | 48 | 0.58 |
| pensioner social solidarity benefit | 241 | 136 | 1.77 |
| simulated retirement benefits | 1,146 | 1,003 | 1.14 |
| large family benefit ^b | 32 | 305 | 0.10 |
| 3rd child benefit | 46 | 67 | 0.69 |
| unprotected child benefit | 29 | 17 | 1.70 |
| civil servant family allowance | 212 | 94 | 2.26 |
| ordinary family allowance | 59 | 48 | 1.24 |
| simulated family benefits | 379 | 532 | 0.71 |
| old age pensions | 7,799 | 9,361 | 0.83 |
| survivor pensions | 1,616 | 1,722 | 0.94 |
| invalidity pensions ^c | 278 | 1,896 | 0.15 |
| non-simulated retirement benefits | 9,693 | 12,979 | 0.75 |
| unemployment benefits | 87 | 492 | 0.18 |
| disability benefits | 45 | 179 | 0.25 |
| other non-simulated benefits | 132 | 670 | 0.20 |
| all benefits^d | 11,350 | 15,184 | 0.75 |

Note: Own elaboration of data collected from social insurance organisations and other benefit agencies.

^a The figure refers to old-age basic pension only, i.e. excludes survivor, invalidity and orphan basic pensions.

^b Administrative data include €131 million spent on lifetime pension to many-children mothers.

^c Administrative data include €328 million spent on sickness benefits.

^d Except housing and emergency benefits (not recorded in the original dataset).

²⁴ As explained in section 3.3.2, those in receipt of invalidity pension were identified in the ECHP database by splitting the original variable PI134 (social benefits / sickness and invalidity). Therefore, the estimate obtained by the model is subject to a margin of error that is probably greater than is usually the case.

²⁵ Retirement benefits here include simulated farmer basic and social pensions, as well as non-simulated old age, survivor and invalidity pensions. Since *EKAΣ* is a top-up benefit to elderly on low income already in receipt of a social insurance pension, recipients of *EKAΣ* were excluded from this calculation of total number of recipients of retirement benefits to avoid double counting.

²⁶ Note that the main source used here for administrative estimates of recipient numbers is the Actuarial Review undertaken on behalf of the Ministry of Labour & Social Insurance (2001), especially Tables 15 & 18 on pages 31 & 34 respectively. Since the Review itself had to rely on estimates drawn from a variety of sources, including Labour Force Surveys, the possibility of the figures reported there being inaccurate should not be discounted.

It should also be mentioned that the model estimates that the number of elderly receiving no pension of any type was 239,300 (12.6% of all elderly) in 1998. Again, this estimate cannot be “validated” as no such estimate is available from other sources.

Turning to the other non-simulated benefits, that is unemployment and disability benefits, it is rather striking that in both cases EUROMOD underestimates the number of recipients by a substantial margin. As with all non-simulated policy instruments, the discrepancy observed ought to be attributed to the underlying database rather than to the model as such.

On the whole, EUROMOD estimated the number of recipients of all benefits at 4.1 million²⁷, compared to a figure of 3.6 million derived from administrative sources, i.e. an overestimate of 16%.

Table 25 on the previous page presents estimates of the aggregate cost of social benefits.

In line with the estimates of recipient numbers discussed above, EUROMOD appears to overestimate expenditure on farmer basic pensions, *EKAΣ*, unprotected child benefit and contributory family allowances. All remaining benefits cost more in reality than estimated by the model.

Comparing Tables 24 and 25 with respect to non-simulated retirement benefits, it appears that EUROMOD overestimates the number of recipients but underestimates total expenditure. The reason for this is that the administrative sources used in each case as comparator are different. Besides, as these benefits are *not* simulated by the model, any remaining discrepancy must be attributed to the ECHP database on which EUROMOD relies rather than the model as such.

On the whole, EUROMOD underestimates total spending on social benefits by 25%. Family benefits taken together as simulated by EUROMOD amount to 29% below actual costs. On the other hand, retirement benefits, whether simulated or not, fare slightly better than average (an underestimate of 22%). Finally, expenditure on unemployment and disability benefits is grossly underestimated by the model (80%), more than is the case with recipient numbers.

4.1.2. Personal income tax

Comparisons between EUROMOD and administrative figures on personal income tax must be handled with care, as tax evasion in Greece is known to be rife²⁸. This is partly reflected in Table 26 on the following page.

Specifically, EUROMOD overestimates taxable income by 29% and the tax base by 12%. As explained in section 2.2.3, the tax base is defined in the model as taxable income minus various exemptions. However, in administrative practice this is offset by upward adjustments to taxable income in the context of what is known as “presumptive taxation”²⁹. Since the main purpose of this practice is to set minimum levels of taxable income for the self-employed, the effect of “presumptive taxation” in terms of tax receipts is modest. This probably explains

²⁷ Strictly speaking, these are numbers of benefit payments made rather than numbers of benefit recipients, in the sense that individuals and their families may combine benefits from various sources, i.e. a main pension and the top-up supplement *EKAΣ*, a family benefit and unemployment benefit and so on.

²⁸ An OECD report cited estimates of the share of the informal economy in GDP at between 24% and 40%. As possible reasons it listed “the large number of self-employed in the workforce, inefficient tax administration, lack of a land register, the complexity and continuous revisions and amendments of tax laws, loopholes due to numerous tax allowances and exemptions, and the so-called ‘third-party’ taxes extensively used to fund various institutions, such as the pension funds of lawyers, engineers and media workers” (OECD 2001: 93).

²⁹ For more detail see the OECD report cited in the previous footnote (OECD 2001).

why EUROMOD overestimates the total amount of tax collected by 39%, in spite of the fact that it overestimates the tax base by only 12%.

Table 26: Personal income tax statistics (1998)

| | EUROMOD estimates | administrative data | ratio |
|----------------------------|----------------------|------------------------|-------|
| no. of tax payers | 6,435,197 | 7,097,967 | 0.91 |
| taxable income (€ million) | 60,760 | 46,956 | 1.29 |
| tax base (€ million) | 53,922 | 48,336 | 1.12 |
| tax collected (€ million) | 5,460 | 3,923 | 1.39 |
| average effective tax rate | 10.1% | 8.1% | 1.25 |

Source: Ministry of Finance (2000).

On the other hand, administrative data on the number of tax payers include spouses in single-earner tax units. In contrast, EUROMOD identifies as tax payers those individuals whose taxable income is non-zero (though in the model about 12,300 individuals do end up with zero income once exemptions are taken into account). As a result of that, the underestimation by EUROMOD of the number of tax payers is more apparent than real.

4.1.3. Social contributions

EUROMOD estimates on social contributions are compared to official statistics in terms of (a) number of contributors and (b) receipts collected.

As shown in Table 27, the model overestimates the number of public sector employees by a very significant margin, while it underestimates number of contributors in all other categories. Discrepancies may be attributed to a combination of sampling error (as in the case of farmers) and reporting error (as in the case of private sector employees) in the underlying database.

Table 27: Social contributions: no. of contributors (1998)

| | EUROMOD estimates | administrative data | ratio |
|--------------------------|----------------------|------------------------|-------------|
| private sector employees | 1,617,152 | 1,949,978 | 0.83 |
| public sector employees | 786,725 | 456,802 | 1.72 |
| self-employed workers | 832,566 | 1,019,853 | 0.82 |
| farmers | 448,219 | 774,546 | 0.58 |
| pensioners | 2,232,938 | 2,499,483 | 0.89 |
| all | 5,917,599 | 6,243,787 | 0.95 |

Note: Own elaboration of data collected from social insurance organisations.

As a whole, there seem to be 326,000 more contributors than estimated by EUROMOD. Part of the difference must be due to the fact that an unknown number of workers pay contributions to more than one social insurance organisation.

Double affiliation is sometimes the case in the model too, where about 224,000 persons contribute to more than one scheme. Nevertheless, EUROMOD simulates double affiliation only when workers have two or more sources of income (e.g. self employment and dependent

employment), while in real life double affiliation can also happen when workers contribute to more social insurance schemes covering different categories of the same income source (e.g. different categories of private sector employment, different categories of self-employment and so on).

Table 28 presents administrative figures and EUROMOD estimates of social contributions in terms of receipts collected. The self-employed and, especially, public sector workers appear to contribute far more in the model than in real life (but also more than might be expected on the basis of their number in Table 27).

In the case of public sector workers, administrative data refer to civil servants alone, therefore excluding contributors to the social insurance schemes of utilities and other public enterprises. The latter are misleadingly included here under private sector employees who are inevitably underestimated by the model. In fact, the figure for *all* employees (i.e. irrespective of whether they work in the private or the public sector) is much nearer that obtained by the model, with a variance of 6%.

On the contrary, the self-employed, farmers and pensioners appear to contribute more in the model than official statistics suggest, both in absolute terms as well as *per capita*.

On the whole, such differences cancel each other out to a considerable extent: total receipts as estimated by the model exceed official figures by a mere 2%, while if only active contributors are taken into account EUROMOD seems exactly to reproduce administrative figures. This is shown below.

Table 28: Social contributions: receipts collected (1998)

| | EUROMOD estimates | administrative data | ratio |
|--------------------------------|----------------------|------------------------|-------------|
| private sector employees | 2,263 | 4,166 | 0.54 |
| public sector employees | 2,198 | 560 | 3.92 |
| all employees | 4,461 | 4,727 | 0.94 |
| self-employed workers | 1,432 | 1,200 | 1.19 |
| farmers | 168 | 157 | 1.06 |
| all active contributors | 6,061 | 6,084 | 1.00 |
| pensioners | 424 | 263 | 1.61 |
| all contributors | 6,485 | 6,347 | 1.02 |

Note: Eurostat (2004), National Statistical Service of Greece (2000).

4.2. Income distribution

As explained earlier, validation of EUROMOD outcomes in terms of income distribution is performed here against:

- (a) the ECHP (wave 6, survey year 1999, incomes earned in 1998) and
- (b) the National Statistical Service of Greece 1998/99 Household Budget Survey.

The poverty and inequality indices used are mostly selected among the 18 indicators of social exclusion and poverty endorsed at Laeken (European Council meeting of December 2001)³⁰.

³⁰ For a list and definitions of all Laeken indicators see CEC (2003).

4.2.1. Poverty

Laeken indicator 1a (“at-risk-of-poverty rate”) refers, as is known, to a poverty line of 60% of median equivalent income. Laeken indicator 11 (“dispersion around the at-risk-of-poverty threshold”) refers to poverty lines of 40%, 50% and 70% of median equivalent income. The resulting estimates are shown in Table 29.

Table 29: Poverty rates at different poverty lines (1998)

| percentage of individuals below $x\%$: of median equivalent income | EUROMOD (1) | ECHP (2) | HBS (3) | ratio (1):(2) | ratio (1):(1) |
|---|----------------|-------------|------------|------------------|------------------|
| 40% | | | | | |
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Estimates with respect to Laeken indicator 1b (“incidence of poverty risk by most frequent activity status”) are shown in Table 30 below.

Table 30: Poverty rates by employment status (1998)

| | EUROMOD (1) | ECHP (2) | HBS (3) | ratio (1):(2) | ratio (1):(1) |
|-------------------------|----------------|-------------|------------|------------------|------------------|
| waged / salaried worker | | | | | |
| self-employed | | | | | |
| unemployed | | | | | |
| retired | | | | | |
| other inactive | | | | | |

Note: Poverty rates are defined as percentage of population below a poverty line of 60% of median equivalent income. The OECD modified equivalence scale applies.

Table 31 below presents competing estimates of Laeken indicator 1c (“incidence of poverty risk by household type”).

Table 31: Poverty rates by household type (1998)

| | EUROMOD (1) | ECHP (2) | HBS (3) | ratio (1):(2) | ratio (1):(1) |
|--------------------------------|----------------|-------------|------------|------------------|------------------|
| single under 30 years | | | | | |
| single 30-64 years | | | | | |
| single man 65+ | | | | | |
| single woman 65+ | | | | | |
| 2 adults at least one aged 65+ | | | | | |
| 2 adults both aged under 65 | | | | | |
| two adults 1 child | | | | | |
| two adults 2 children | | | | | |
| two adults 3 children | | | | | |
| two adults 4+ children | | | | | |
| single parent 1+ children | | | | | |
| 3+ adults 1+ children | | | | | |
| other households | | | | | |

Note: Poverty rates are defined as percentage of population below a poverty line of 60% of median equivalent income. The OECD modified equivalence scale applies. The estimates for the household type “single under 30 years” rely on less than 50 observations. Children are defined as individuals aged 18 years or less.

Table 32 below presents estimates of three indicators of poverty intensity, the first of which is Laeken indicator 4 (“relative median poverty risk gap”).

Table 32: Poverty intensity (1998)

| | EUROMOD (1) | ECHP (2) | HBS (3) | ratio (1):(2) | ratio (1):(1) |
|------------------------------|----------------|-------------|------------|------------------|------------------|
| relative median poverty gap | | | | | |
| males | | | | | |
| females | | | | | |
| relative average poverty gap | | | | | |
| males | | | | | |
| females | | | | | |
| FGT index ($\alpha=2$) | | | | | |
| males | | | | | |
| females | | | | | |

Note: Poverty gaps are defined as the median or average income shortfall of poor households from the poverty line as a percentage of the latter. The Foster-Greer-Thorbecke index ($\alpha=2$) attaches greater weight to larger poverty gaps, as it takes into account the poverty incidence, the poverty gap and the extent of inequality among the poor. The modified OECD equivalence scale is used.

4.2.2. Inequality

Finally, validation of EUROMOD outcomes is performed in terms of income inequality. Two inequality indices are examined here. Laeken indicator 2 is “income quintile ratio (S80/S20)”, defined as the ratio of total income received by the 20% of the country’s population with the highest income (top quintile) to that received by the 20% of the country’s population with the lowest income (bottom quintile), where income must be understood as equivalent disposable income. Laeken indicator 14 is the Gini coefficient.

Table 33: Inequality statistics (1998)

| | EUROMOD (1) | ECHP (2) | HBS (3) | ratio (1):(2) | ratio (1):(1) |
|--------------------------|----------------|-------------|------------|------------------|------------------|
| quintile ratio (S80/S20) | | | | | |
| males | | | | | |
| females | | | | | |
| Gini coefficient | | | | | |
| males | | | | | |
| females | | | | | |

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