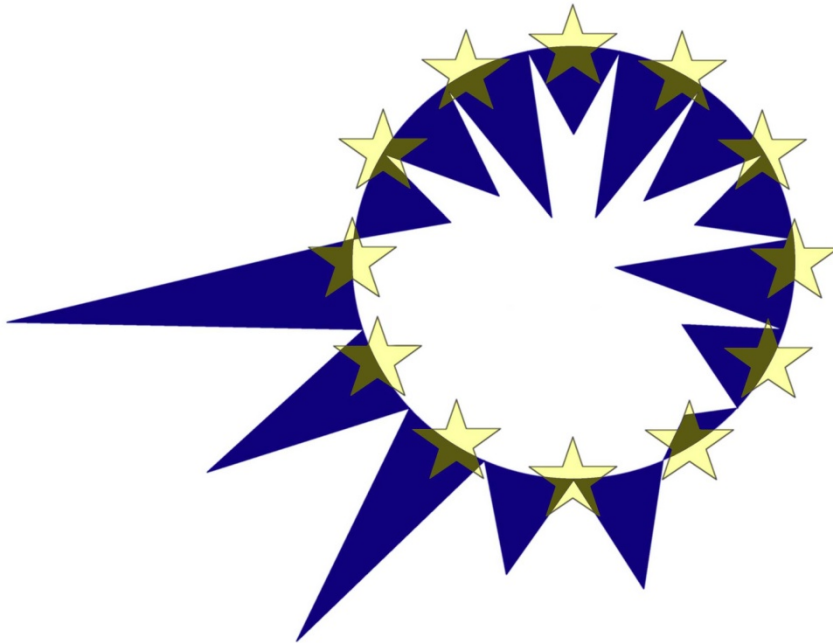


EUROMOD

COUNTRY REPORT



DENMARK (2007-2010)

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July 2012



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

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

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

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Kristian Vest Nielsen (until August 2011)

The results presented in this report are derived using EUROMOD version F6.0 EUROMOD is continually being improved and the results presented here may not match those that would be obtained with later versions of EUROMOD.

For more information, see: <http://www.iser.essex.ac.uk/research/euromod>

This document is supported by the European Union Programme for Employment and Social Solidarity – PROGRESS (2007-2013).

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

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

PROGRESS mission is to strengthen the EU contribution in support of Member States' commitment. PROGRESS is instrumental in providing analysis and policy advice on PROGRESS policy areas; monitoring and reporting on the implementation of EU legislation and policies in PROGRESS policy areas; promoting policy transfer, learning and support among Member States on EU objectives and priorities; and relaying the views of the stakeholders and society at large

For more information see: <http://ec.europa.eu/progress>

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



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1. BASIC INFORMATION

1.1 Basic figures

Table 1.1 Basic figures

	Pop. (1,000)	pop. < 18 (%)	pop. ≥ 65 (%)	Life expect. (years)		Fertility rate	Unemp rate	GDP per head (PPP)	Currency	
				Males	Females				Name	exch. rate
2007	5,447	22.3	15.3	75.9	80.5	1.84	3.7	41,675	Kroner	7.44
2008	5,476	22.2	15.6	76.3	80.7	1.89	2.7	42,847	Kroner	7.46
2009	5,511	22.1	15.9	76.5	80.8	1.84	5.0	40,545	Kroner	7.45
2010	5,535	22.0	16.3	77.1	81.2	1.88	6.2	42,464	Kroner	7.45

Sources: StatBank Denmark (BEF5, FOD3, HISB7, AUL01, RAS3307).

1.2 The tax-benefit system

Table 1.2. Tax-benefit system and government budget

	Total general government revenue ^[1] % of GDP	Social protection ^[2] % of GDP
2007	50.8	16.4
2008	51.5	16.2
2009	58.0	18.3
2010	57.8	18.5

Source: Eurostat (gov_a_exp)

Table 1.3 Social protection expenditure by function (as % of total social protection expenditure)

	Sickness & disability	Old age	Family/ children	Unemployment	Housing	Social exclusion
2007	24.0	31.1	22.5	11.8	3.0	2.1
2008	24.8	31.3	22.7	10.8	2.9	2.1
2009	24.2	30.7	22.5	12.1	2.8	2.3
2010	23.6	30.6	21.7	13.5	2.8	2.4

Source: StatBank Denmark (OFF23); Eurostat (gov_a_exp for social exclusion);

Table 1.4 Taxation (as % of total tax receipts)

	Personal income tax	Corporate income tax	Social security contributions		Taxes on goods and services	Other taxes
			Employees	Employers		
2007	51.7	7.7	2.0	0.5	33.5	4.5
2008	52.5	6.9	2.0	0.5	32.6	5.5
2009	55.1	4.8	2.0	0.5	31.8	5.7
2010	51.0	5.8	2.0	0.6	31.7	9.0

Source: StatBank Denmark (OFF12).



1.2.1 Basic information about the tax-benefit system

- The Danish tax and benefit system is almost exclusively based on uniformly set rules and rates and the tax authority is a country-wide authority. Municipalities can set the rate of the municipality tax, the church tax and the land value tax.
- The Danish tax system is based on annual incomes and the income year follows the calendar year.
- The general pension age is 65 for old-age pension, for both sexes. In a few occupations, e.g. academics, it is however possible to postpone retirement by typically 2 years.
- Children are obliged to 10 years of schooling (at a public school or at an equivalent level at home, private schools etc.), typically starting in August the (calendar) year the child turns 6 years.
- Both adults and children are taxed individually, as a starting point. However, minor incomes for children from e.g. help at home or at parents' company are disregarded. Child benefits are typically paid to the mother.
- The tax system is mainly based on individual personal taxation, although there are a few possibilities for married spouses to, for instance, transfer redundant deductions in the different tax bases.
- Denmark to some degree has a dual tax system, where private capital incomes are taxed at a different rate than labour and transfer incomes. Both labour, transfer and capital incomes however are part of a comprehensive personal income tax system and enter alongside into various tax bases. Share income is taxed fully separately.
- Taxes on labour and transfer incomes are withheld at source, through third-party reporting and payment by employers etc. The tax assessment is based on a preliminary assessment of income, which can also be changed by the tax payer. After the end of an income year a final tax return has to be filled/confirmed by all tax payers, but most items are filled already through the third-party reporting system.
- Both benefits and deductions in the tax system are indexed automatically through an adjustment of rates signed into law, according to which the indexation follows wage inflation (slightly less so for benefits).
- Means-tested benefits are typically held up against incomes from the most recent tax annual statement.

1.3 Social Benefits

Social assistance (*Kontanthjælp*): Social Assistance is the basic income maintenance instrument in the event of unemployment, long-term illness etc. Benefit level varies with provider status and by whether recipient is living with parents. Means-tested against both own and spouses' income and wealth. Reduced after 6 month.

Unemployment benefits (*Dagpenge*): UB are insurance-based, but subsidized. Set at 90 per cent of previous labour income, but with upper threshold. Restricted to 4 out of a running 6 years. The full right can be re-established by ½ year of full-time work.

Sickness benefits (*Sygedagpenge*): After two weeks of illness the municipality ascertains the ability to work and eligibility for sickness benefits. Benefit levels vary by number of working hours and unemployment insurance status.



Education grant (*Statens Uddannelsesstøtte, SU*): Given to students in validated branches of study. Benefit levels vary by age, type of education and place of living (with parents/by oneself).

Child family grant (*Børnefamilieydelse*): Families with children below 18 are paid a tax-free child family grant, with benefit size varying with the age of the child. The grant is automatically paid to the mother if not the father has the sole custody for the child.

Child benefits (*Børnetilskud*): A number of different child benefits are paid, typically to the mother, to families/children in special circumstances, such as single parents/providers, pensioner or student parents, twins etc.

Child support (*børnebidrag*): After divorce, separation or out-of-wedlock birth, parents are obliged to pay child support/alimony to the child (that is, in practice to the upbringing parent).

Housing benefit (*Boligsikring*): Tax-free benefits for tenants who are not old-age pensioners. Given as a function of the rent, excl. costs for heating etc. Phased out, based on household income and wealth.

Housing grant (*Boligydelse*): Tax-free benefits for tenants who are old-age pensioners. Given as a function of the rent, excl. costs for heating etc. Phased out, based on household income and wealth.

Disability pension (*Førtidspension*): Given to persons below retirement age with permanently reduced ability to work after all other possibilities to be or become self-supporting have discarded. Taxable. Benefit varies with marital status. Phased out against own and spouses' income.

Early retirement pension (*Efterløn*): Full or partial retirement by choice from the age of 60 until the standard retirement age of 65. Conditional upon previous unemployment insurance and pension contributions. Higher benefit if retirement is postponed 2 years.

Old-age pension (*Folkepension*): Given after age of 65. Benefit level varies with marital status. The benefit is phased out against own labour income.

Old-age pension supplement (*Pensionstillæg*): Given after age of 65. Benefit level varies with marital status. The benefit is phased out against both own and a spouses labour income.

Heating subsidy (*Varmetillæg*): Old-age and disability pensioners can apply for a heating subsidy to cover parts of their costs for heating fuel. Phased-out against income and wealth.

Survivors' benefits (*Efterlevelsespension*): Old-age or disability pensioners can for a period of 3 month receive a survivors' benefits when the partner dies. The monthly benefit is equal to the couple's combined pension payment.

Survivors' help (*Efterlevelshjælp*): A person, whose partner (married or cohabitant) dies, can receive a lump-sum taxable benefit. Phased out.

Old-age supplementary benefit (*Ældrecheck*): Annual taxable benefit paid out to all old-age pensioners with liquid financial assets below 58,200 dkr. (in 2007).

Green check (*Grøn check*): Introduced from 2010 as a tax-free lump sum benefit to compensate for the increase in environmental and energy taxes, with rates varying between adults and children. For at most two children per family. Paid individually to adults. Benefits to children are disbursed to the mother.



- *Scope and scale*

The following tables provide an indication of the relative scale and coverage of each benefit by showing the number of recipients and the expenditure on each benefit.

Table 1.5 Social benefits: recipients (as % of population)

	2007	2008	2009	2010
Social assistance (<i>kontanthjælp</i>)	3.2	3.1	3.6	-
Unemployment benefits (<i>dagpenge</i>)	5.3	4.5	6.5	-
Sickness benefits (<i>sygedagpenge</i>)	5.1	5.1	5.0	-
Education grant (<i>SU</i>)	7.0	7.0	7.4	-
Child family grant (<i>børnefamilieydelse</i>)	15.7	15.7	15.6	15.5
Child benefits (<i>børnetilskud</i>)	2.9	2.9	2.9	3.0
Child support (<i>børnebidrag</i>)	2.4	2.3	2.3	2.2
Housing benefit (<i>boligsikring</i>)	9.3	9.0	9.1	9.8
Housing grant (<i>boligyldelse</i>)	15.6	15.2	14.7	14.4
Disability pension (<i>førtidspension</i>)	5.6	5.5	5.4	5.5
Early retirement pension (<i>efterløn</i>)	4.2	4.2	4.0	-
Old-age pension (<i>folkepension</i>)	19.5	19.7	19.9	20.7
Heating subsidy (<i>varmetillæg</i>)	4.0	-	-	-
Old-age supplementary benefit (<i>ældrecheck</i>)	4.9	4.8	5.2	5.6

Notes:

Sources: StatBankDenmark (PEN11, PEN22, KONT4, BIDRAG22, INDKP1, BTS66, BTS44); www.penst.dk; Own calculations using registry data.

Table 1.6 Social benefit: expenditure

	2007	2008	2009	2010
Annual expenditure (mill. DKK)	78399,38	76303,76	87683,61	21016,38
as % of total expenditure				
Social assistance (<i>kontanthjælp</i>)	10.2	9.3	9.1	-
Unemployment benefits (<i>dagpenge</i>)	14.3	10.1	17.6	-
Sickness benefits (<i>sygedagpenge</i>)	14.5	15.5	13.7	-
Education grant (<i>SU</i>)	12.9	13.7	13.3	-
Child family grant (<i>børnefamilieydelse</i>)	4.2	4.6	4.1	17.4
Child benefits (<i>børnetilskud</i>)	0.3	0.3	0.3	1.2
Child support (<i>børnebidrag</i>)	2.3	2.3	2.0	8.6
Housing benefit (<i>boligsikring</i>)	0.3	0.3	0.2	1.1
Housing grant (<i>boligyldelse</i>)	0.9	0.9	0.8	3.6
Disability pension (<i>førtidspension</i>)	3.6	3.9	3.5	15.7
Early retirement pension (<i>efterløn</i>)	25.8	28.2	24.0	-
Old-age pension (<i>folkepension</i>)	8.3	8.9	8.8	41.2
Heating subsidy (<i>varmetillæg</i>)	0.5	-	-	-
Survivors' help (<i>efterlevelseshjælp</i>)	0.0	0.0	0.0	0.0
Old-age supplementary benefit (<i>ældrecheck</i>)	1.9	2.0	2.4	11.2

Notes: Total expenditure for all income benefits is the sum for all benefits for each year

Sources: StatBankDenmark (PEN11, PEN22, KONT4, BIDRAG22, INDKP1, BTS66, BTS44); www.penst.dk; Own calculations using registry data.



- *Not strictly benefits*

Flex-job (*Fleksjob*): May be granted to employees with permanent disabilities. The recipient works part-time but is paid a full wage from an employer, who receives a wage subsidy corresponding to the reduction in hours. Also possible for unemployed (*ledighedsydelse*) and early retirees (*fleksydelse*).

1.4 Social contributions

Denmark has a number of payments which contribute to the accrual of unemployment benefits and old-age pensions. However, the major part of transfer benefits is financed through the general tax system.

Supplementary labour market pension (*Arbejdsmarkedets tillægspension, ATP*): Mandatory old-age pension contribution, paid with a fixed rate that varies with the length of employment contract (e.g. month) and the extend of work (full-/part-time). Paid by employee (one-third of rate) and employer (two-third of rate). Also payments for benefit recipients.

Unemployment benefit contribution (*A-kasse-bidrag*): Required for eligibility for unemployment benefits (see above). Conditional upon union membership. Rates vary across unemployment insurance funds. Deductable in taxable income.

Early retirement pension scheme contribution (*Efterlønsbidrag*): Required for eligibility for early retirement pension scheme (see above). Conditional upon union membership. Deductable in taxable income.

- *Scope and scale*

Table 1.7 Social contributions: contributors (as % of population)

	2007	2008	2009	2010
Social contributions				
Supplementary labour market pension (<i>ATP</i>)	69.7	69.8	68.4	-
Unemployment benefit contribution (<i>A-kasse-bidrag</i>)	50.5	49.9	49.6	-
Early retirement pension contribution (<i>Efterlønsbidrag</i>)	30.6	30.5	28.8	-

Notes: Statistics for 2010 were not yet available.

Source: StatBankDenmark (BEF5); Own calculations using registry data.

Table 1.8 Social contributions: revenue

	2007	2008	2009	2010
Social contributions (mill. DKK)	15627	15694	15444	
as % of total revenue				
Supplementary labour market pension (<i>ATP</i>)	49.4	49.0	55.6	-
Unemployment benefit contribution (<i>A-kasse-bidrag</i>)	12.0	11.1	6.6	-
Early retirement pension scheme contribution (<i>Efterlønsbidrag</i>)	38.6	39.9	37.8	-

Notes: Statistics for 2010 were not yet available.

Source: StatBankDenmark (BEF5); Own calculations using registry data.



1.5 Taxes

Labour market contribution (*Arbejdsmarkedsbidrag*): A tax of 8 per cent levied upon gross labour income, with deduction of only the employee-paid part of the supplementary labour market pension contributions.

Earned income tax credit (*Beskæftigelsesfradrag*): Negative marginal tax rate on labour income, with a maximum allowance.

Municipality tax (*Kommuneskat*): The tax rate is determined individually by the 98 municipalities, but collected through the state's tax system and levied upon the taxable income base after a personal allowance.

Church tax (*Kirkeskat*): A voluntary contribution collected through the tax system, if the individual tax payer does not opt out. The rate is determined individually by the 98 counties (0.41-1.50 per cent) and levied upon the taxable income base after subtracting the general personal allowance.

Health contribution (*Sundhedsbidrag*): A tax of 8 per cent, levied upon the taxable income base after subtracting the general personal allowance.

Bottom-bracket tax (*Bundskat*): The lowest of the three progressive state taxes. Tax rate falls from 5.48 percent in 2007 to 3.67% in 2010. Levied upon the sum of the personal income tax base and positive net capital income, with the general personal allowance subtracted. Spouses can transfer negative net capital income and any unused personal allowance between them for the calculation of the bottom-bracket tax.

Medium-bracket tax (*Mellemskat*): The middle of the three progressive state taxes. Tax rate of 6%. Levied upon the sum of the personal income tax base and positive net capital income, with the middle bracket tax allowance subtracted. Spouses can transfer negative net capital income and any unused middle-bracket tax allowance. The middle-bracket tax has been abolished from the tax year 2010.

Top-bracket tax (*Topskat*): The highest-level of the three progressive state taxes. Tax rate of 15%. Levied upon the sum of the personal income tax base, positive net capital income and contribution to capital pension schemes, with the top-bracket tax allowance subtracted. From the tax year 2010, a basic yearly allowance of 40.000 dkr. for the inclusion of positive net capital income is introduced.

Tax ceiling (*Skatteloft*): A ceiling of 59% (reduced to 51.5% in 2010) on the aggregate (nominal) tax rate is implemented by reducing the tax rate on the top-bracket tax by the difference between the tax ceiling and the sum of the municipal and state taxes, excluding the church tax.

Multimedia tax (*Multimedieskat*): All tax payers, who have an employer-provided computer, telephone or internet connection at their disposal, are taxed for 3.000 dkr. in the personal income tax base. Introduced in 2010.

Shares tax (*Aktieskat*): Net income from shares (share profits, dividends and premiums, minus losses) is taxed progressively below/above 45.500 dkr. (in 2007) at 28% resp. at 43%. In 2008 and 2009 an additional progressivity threshold was introduced, which has been abolished from tax year 2010 on.

Property value tax (*Ejendomsværdiskat*): A progressive state tax on the overall value of property, based on the official/public property valuation. Both this tax base and the threshold for the progressivity have been frozen nominally since 2002.



Land value tax (*Grundskyld*): A municipal tax on the land value of residential property, with tax rates set by the municipalities varying between 1.6% and 3.4% in 2007.

Value-added tax (*Moms*): Tax rate of 25%. Is levied uniformly upon all transactions.

Excise duties (*Punktafgifter*): Various excise taxes with varying tax rates or duties are levied upon goods such as cigarettes, energy use, environmentally hazardous goods.

Inheritance tax (*Boafgift*): The estate is taxed with 0%, 15% or 36,25% for a spouse, near relatives or more distant relatives as heirs.

Gift tax (*Gaveafgift*): Gifts are taxed with 0%, 15% or 36,25% for a spouse, near relatives or more distant relatives as recipients.



- *Scope and scale*

Table 1.9 Taxes: taxpayers (as % of population)

	2007	2008	2009	2010
Direct taxes				
Labour market contribution (<i>Arbejdsmarkedsbidrag</i>)	63.8	64.2	62.0	59.3
Earned income tax credit (<i>Beskæftigelsesfradrag</i>)	63.8	64.2	62.0	59.3
Municipality tax (<i>Kommuneskat</i>)	94.5	93.7	93.0	-
Church tax (<i>Kirkeskat</i>)	78.6	77.5	76.5	-
Health contribution (<i>Sundhedsbidrag</i>)	94.8	94.2	93.5	-
Bottom-bracket tax (<i>Bundskat</i>)	95.3	94.8	94.1	-
Medium-bracket tax (<i>Topskat</i>)	27.9	29.3	14.3	-
Top-bracket tax (<i>Topskat</i>)	21.8	22.8	21.0	-
Shares tax (<i>aktieskat</i>)	23.9	23.8	13.1	-
Property value tax (<i>Ejendomsværdiskat</i>)	46.7	46.9	46.7	-
Land value tax (<i>Grundskyld</i>)	46.7	46.9	46.7	-
Inheritance tax (<i>Boafgift</i>)	1.3	1.3	1.3	1.2
Indirect taxes				
Value-added tax (<i>Moms</i>)	100	100	100	100
Excise duties (<i>Punktafgifter</i>)	100	100	100	100

Notes: Number of taxpayers paying the labour market contribution or making use of the earned income tax credit is set equal to the number of employed. Number of taxpayers paying the land value tax is set equal to the number of taxpayers paying the property value tax. The full population of tax payers is assumed to pay indirect taxes through their consumption.

Source: StatBankDenmark (RAS3, OFF12, PSKAT1, PSKAT2, PSKAT3, SKAT,BEF5), The Courts Agency (Domsstolsstyrelsen - Statistik for skiftesager 2007-2010).



Table 1.10 Taxes: revenue

	2007	2008	2009	2010
Annual revenue (mill. DKK)	718,072	737,855	704,930	290,814
as % of total revenue				
Direct taxes				
Labour market contribution (<i>Arbejdsmarkedsbidrag</i>)	9.5	9.7	10.0	-
Earned income tax credit (<i>Beskæftigelsesfradrag</i>)	2.3	3.7	4.1	-
Municipality tax (<i>Kommuneskat</i>)	24.2	24.2	25.2	-
Church tax (<i>Kirkeskat</i>)	0.7	0.7	0.7	-
Health contribution (<i>Sundhedsbidrag</i>)	7.9	7.8	8.2	-
Bottom-bracket tax (<i>Bundskat</i>)	6.5	6.6	6.3	-
Medium-bracket tax (<i>Topskat</i>)	1.3	1.3	0.8	-
Top-bracket tax (<i>Topskat</i>)	2.5	2.6	2.4	-
Shares tax (<i>aktieskat</i>)	2.2	1.5	1.1	-
Property value tax (<i>Ejendomsværdiskat</i>)	1.6	1.6	1.8	-
Land value tax (<i>Grundskyld</i>)	2.2	2.3	2.6	6.8
Inheritance tax (<i>Boafgift</i>)	0.5	0.6	0.5	1.3
Indirect taxes				
Value-added tax (<i>Moms</i>)	24.5	23.9	23.9	59.6
Excise duties (<i>Punktafgifter</i>)	14.0	13.3	12.4	32.4

Notes: Annual revenue (DKK) is the total sum of all taxes

Source: Source: StatBankDenmark (RAS3, OFF12, PSKAT1, PSKAT2, PSKAT3, SKAT, BEF5), The Courts Agency (Domsstolsstyrelsen - Statistik for skiftesager 2007-2010).

2. SIMULATION OF TAXES AND BENEFITS IN EUROMOD

2.1 Scope of simulation

Tables 2.1 and 2.2 present an overview over the simulated benefits and taxes and social contributions, respectively. Only one set of tables is presented, as there are no structural changes across the policy years.



Table 2.1 Simulation of benefits in EUROMOD

	Variable name(s)	Treatment in EUROMOD				Why not fully simulated?
		2007	2008	2009	2010	
Unemployment benefits	bunct_s	PS	PS	PS	PS	No data on unemployment history; Previous earnings inferred from unemployment benefit received.
Sickness benefits	bhl	I	I	I	I	No data on health status.
Social Assistance	bsa_s	S	S	S	S	No data on length of stay in Denmark. No data on background for reduced rates for youth (<25).
Education grant	bed	I	I	I	I	
Child Family Grant	bfachnm_s	S	S	S	S	
Ordinary Child Benefit & supplement	bfach00_s	S	S	S	S	
Child benefit for student parents	bfached_s	S	S	S	S	
Child benefits for twins etc. & adoptions	-	I	I	I	I	Rare benefit.
Child support	-	E	E	E	E	No information on parents outside household.
Disability pension	pdi	I	I	I	I	No impartial information on ability to work
Housing benefit	bho01_s	S	S	S	S	
Housing grant	bho02_s	S	S	S	S	
Heating benefit	-	E	E	E	E	No information on heating costs and benefit application
Early retirement pension	-	E	E	E	E	
Old-age pension	poa00_s	S	S	S	S	
Old-age pension supplement	poa01_s	S	S	S	S	
Old-age supplementary benefit	poa02_s	S	S	S	S	
Survivors' benefits	-	I	I	I	I	No information on death of partner
Green check	bhtuc_s	-	-	-	S	Only introduced in 2010.

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



Table 2.2 Simulation of taxes and social contributions in EUROMOD

	Variable name(s)	Treatment in EUROMOD				Why not fully simulated?
		2007	2008	2009	2010	
Labour market contribution	tsee_s, tscse_s	S	S	S	S	-
Supplementary labour market contribution	tscpi_s	PS	PS	PS	PS	No information on length of employment contract => monthly assumed.
Contributions to unemployment insurance scheme & early retirement pension scheme	tyrui_s	PS	PS	PS	PS	No individual data on contribution => randomly assigned from population data.
Earned Income Tax Credit	tintc_s	S	S	S	S	-
Municipality tax	tmu_s	S	S	S	S	-
Church tax	tcr_s	PS	PS	PS	PS	No data on tax payment => randomly assigned from population data; No data on municipality of residence => average tax rate.
Health contribution	thl_s	S	S	S	S	-
Bottom-bracket tax	tinbt_s	S	S	S	S	-
Middle-bracket tax	tinmd_s	S	S	S	S	-
Top-bracket tax	tinto_s	S	S	S	S	-
Multimedia tax	-	-	-	-	E	No information on the tax base.
Shares tax	-	E	E	E	E	No isolated data on share income
Property value tax	tpr_s	PS	PS	PS	PS	Tax base derived from tax payment.
Land value tax	xhc	I	I	I	I	No isolated data on the tax payment or on the land value.
Inheritance tax	-	E	E	E	E	No information on inheritance
Gift tax	-	E	E	E	E	No information on gifts
Added-value tax	-	E	E	E	E	No information on total consumption expenditures

Notes: “-” policy did not exist in that year; “E” policy is *excluded* from the model’s scope as it is neither included in the microdata nor simulated by EUROMOD; “PS” policy is *partially simulated* as some of its relevant rules are not simulated; “S” policy is *simulated* although some minor or very specific rules may not be simulated.



2.2 Order of simulation and interdependencies

The following table shows the order in which the main elements of the Danish system in 2007-2010 are simulated. As the Danish system only shows structural changes in 2010, and these changes only occur inside single instruments, we use one table to display the order of simulation over the four year time span.

The labour market contribution and the supplementary labour market pension contribution are the first instruments to be simulated, as both are functions of only gross employment incomes.

Taxable benefits such as the unemployment benefit and social assistance are simulated before the simulation of taxes, as they enter the tax bases. Likewise for the earned income tax credit, which is a function of gross employment income and both the labour market contribution and the supplementary labour market pension contribution.



Table 2.3 EUROMOD Spine: order of simulation, 2007-2010

Policy	Description	Main output
tsc_dk	Labour Market Contribution, a gross tax on all employment income	tscee_s, tscse_s, tsc_s
tscpi_dk	Supplementary labour market pension contribution, a mandatory pension contribution	tscpiee_s, tscpier_s
tyrui_dk	Unemployment benefit contribution and early retirement pension contribution, voluntary contribution to individual unemployment benefit insurance/early retirement accounts	tyrui_s
bunct_dk	Unemployment benefits and similar benefits	bunct_s
tintc_dk	Earned Income Tax Credit	tintc_s
poa_dk	Old age pension benefits(basic amount) supplement pension and old-age supplementary benefit	poa00_s, poa01_s, poa02_s
bsa_dk	Social Assistance	bsa_s
tmu_dk	Municipality Tax	tmu_s
tcr_dk	Church Tax	tcr_s
thl_dk	Health Contribution, a tax	thl_s
tinbt_dk	Bottom Bracket Tax	tinbt_s
tinmd_dk	Medium Bracket Tax ¹	inmd_s
tinto_dk	Top-bracket tax	tinto_s
tpr_dk	Property Tax	tpr_s
bfachnm_dk	Child Family Grant	bfachnm_s
bfach00_dk	Ordinary child benefit & Supplementary child benefit &	bfach00_s
bfached_dk	Child benefit for student parents	bfached_s
bho01_dk	Housing Benefit	bho1_s
bho02_dk	Housing Grant	bho2_s
bhtuc_dk	Green check (lump sum transfer) ²	bhtuc_s

2.3 Social benefits

2.3.1 Unemployment benefit (*bunct_s*)

- *Definitions*

The unit of analysis is the individual (*tu_individual_dk*).

- *Eligibility conditions*

Member of an unemployment insurance fund and positive unemployment spell in the current year.

- *Income test*

Upper limit on the received benefit, see below.

¹ The tax has been abolished in 2010

² The benefit has been introduced in 2010



- **Benefit amount**

90 per cent of the previous employment income, with an upper limit of 177,580DKK per year in 2007.

Between 2008 and 2010 the upper limit increased respectively to 182,180 DKK, 188,500 DKK and 195,520 DKK per year.

EUROMOD Notes: 1) Membership of an unemployment fund ($lrg=1$) is simulated through a discrete model based on national register data. 2) According to the law, the maximum amount of benefit that can be received varies according to the insurance status of the recipient, e.g. part-time insured vs. full time insured. Only full time insurance is assumed in the EUORMOD simulation. The maximum amount for part time insured people is equal to 2/3 of the full time maximum. 3) Previous employment income is not recorded by EU-SILC. For this reason, starting from the benefit amount, the previous employment income is calculated for those receiving the benefit by reversing the benefit rule. The unemployment benefit is then simulated using the simulated previous earnings.

2.3.2 Social assistance (*bsa_s*)

- **Definitions**

The unit of analysis is the individual (*tu_individual_dk*), although married partner income and wealth and the presence of dependent children enter in the simulation (*tu_bsa_dk*). Children are considered those younger than 18 years old.

- **Eligibility conditions**

Eligibility is conditional upon:

- The person has experienced an exogenous shock (e.g unemployment, divorce, etc) and the person is not able to maintain a living
- Economics needs cannot be fulfilled by other means, including wealth
- The person is a EU citizen or has stayed in Denmark for 7 of the previous 8 years
- No other incomes ($il_bsa=0$).

- **Income test**

The income test is satisfied if the recipients do not have any income and any financial wealth left. Financial assets < 10,000DKK (<20,000DKK) for single (married) recipients are disregarded from the asset test.

Married partners are obliged to support each other. For this reason incomes of the married partner are withdrawn from the amount received by the person entitled.



- **Benefit amount**

Table 2.4. Social assistance benefits, 2007-2010, pr. month

<i>Age < 25</i>	2007	2008	2009	2010
	----- dkr. -----			
Provider	11,904	12,249	12,629	13,096
Non-provider				
- <i>living by oneself</i>	5,773	5,940	6,124	6,351
- <i>living with parents</i>	2,786	2,867	2,956	3,065
<i>Age ≥ 25</i>	2007	2008	2009	2010
	----- dkr. -----			
Provider	11,904	12,249	12,629	13,096
Non-provider	8,959	9,219	9,505	9,857

EUROMOD Notes: 1) The conditions on having experienced an exogenous shock and on citizenship are not simulated. 2) The income test is performed using the income list *il_bsa*. Its components are: Earnings, Old age pensions, Disability Pensions, Survivor Pensions, Early Retirement Pensions, Private Pensions, and Unemployment Benefits.

2.3.3 Child family grant (*bfachnm_s*)

- **Definitions**

The unit of analysis is a parent and own dependent children (*tu_bfa_dk*).

- **Eligibility conditions**

Having children aged 0-17 years.

- **Income test**

None.

- **Benefit amount**

The benefit varies for 0-2 year olds, 3-6 year olds and 7-17 year old children, with annual benefits of 13,892DKK, 12,552DKK and 9,876DKK, respectively, see table 2.5.

Table 2.5. Benefits for child family grant, per child and year, 2007-2010

Age of the child	2007	2008	2009	2010
	----- dkr. -----			
0-2 year olds, per year	13,892	14,156	16,428	16,988
per quarter	3,473	3,539	4,107	4,247
3-6 year olds, per year	12,552	12,792	13,004	13,448
per quarter	3,138	3,198	3,251	3,362
7-17 year olds, per year	9,876	10,064	10,232	10,580
per quarter	2,469	2,516	2,558	2,645

EUROMOD Notes: The benefit is assigned to the mother if any.



2.3.4 Ordinary child benefit and supplement (*bfach00_s*)

- *Definitions*

The unit of analysis is a parent and own dependent children (*tu_bfa_dk*).

- *Eligibility conditions*

Lone parent, or both parents old-age pensioners, or both parents disability pensioners.

- *Income test*

None.

- *Benefit amount*

4,428DKK per child in ordinary child benefit plus a supplement of 4,504DKK per benefit unit for lone providers, see table 2.6.

Table 2.6. Ordinary child benefit rates, pr. year, 2007-2010

	Basic	Supplement
	----- dkr. -----	
2007	4,428	4,504
2008	4.556	4.636
2009	4.696	4.780
2010	4.868	4.956

2.3.5 Child benefit for student parents (*bfached_s*)

- *Definitions*

The unit of analysis is a parent and own dependent children (*tu_bfa_dk*).

- *Eligibility conditions*

Being in tertiary education and having child(ren) and being

- lone parent not receiving education grant (benefit for all children), or
- living with partner, but only one receives education grant (benefit for all children), or
- living with partner, and both receive education grant (benefit for children beyond the first)

- *Income test*

None.

- *Benefit amount*

5,808DKK per children per year in 2007 (beyond the first if living with partner and both receive education grant). Between 2008 and 2010 the yearly benefit amount increased to 5976 DKK, 6160 DKK and 6388 DKK.



2.3.6 Green check (*bhtuc_s*)

- *Definitions*

The unit of analysis is the adult individual, but the number of dependent children are relevant for the simulation (*tu_bhtuc_dk*). A child is considered as dependant if younger than 18 years old.

- *Eligibility conditions*

All persons liable to pay taxes aged 18 or older.

- *Income and wealth test*

The green check is phased out with 7.5 per cent against incomes above a threshold of 362,800 dkr. (2010-level), where the relevant income is the tax base for the top bracket tax (without taking account the deduction of contributions to capital pension schemes).

- *Benefit amount*

The annual benefit amounts to 1,300 dkr. for adults (>18 years of age) and 300 dkr. for children (for at most two children per family). Benefits for children are given to the mother.

2.3.7 Housing Allowance

Housing allowance is the comprehensive term for the housing benefit for tenants and the housing grant for pensioners. Both forms of housing allowances are tax-free. The following only deals with the most important rules, as the housing allowance even according to official documentation is explicitly complex.

A common term for the housing allowance is the housing cost, which is defined as the pure rent for the tenancy, excluding costs for heating, electricity etc. However, under some circumstances related both to characteristics of the dwelling and of the tenancy, the housing cost is augmented. The impossibility to fully simulate these circumstances obliged us to derive the housing cost reversing the rule for the calculation of the housing allowance. Then a regression analysis has been performed at the household level to impute a plausible value of housing cost to households not receiving housing allowances. The derived variable is called *xivhc*.



2.3.7.1 Housing Benefit (*bho01_s*)

- *Definitions*

The unit of analysis is the household (*tu_bho_dk*)

- *Eligibility conditions*

Tenants who are not pensioners (*poa00=0* at the household level).

- *Income and wealth test*

The benefit is phased-out against the total incomes of all hhd. members, and wealth. Personal income base (*il_persinc*) and positive net capital income are taken into account. Incomes from children living with their parents are included in the relevant household income, but only after deducting 16,900 dkr., see table 2.7.

Table 2.7. Deductions in childrens incomes before deduction, 2007-2010

	-- dkr. --
2007	16,900
2008	17,200
2009	17,500
2010	18,100

The household income is augmented to take account of financial wealth (see table below).

Table 2.8. Income augmentation with wealth for calculation of housing benefit, 2007-2010

Year	Per cent	Wealth thresholds
2007	0	< 632,800
	10	632,800 – 1,265,700
	20	> 1,265,700
2008	0	644,800
	10	644,800 – 1,289,700
	20	> 1,289,700
2009	0	< 655,800
	10	655,800 – 1,311,700
	20	> 1,311,700
2010	0	< 678,100
	10	678,100 – 1,356,300
	20	> 1,356,300

Benefit amount to 60 per cent of the housing costs. From this 18 per cent of the income that exceeds 120,200 dkr. (in 2007) is subtracted. This income threshold is augmented by 31,700 dkr. (in 2007) for each child beyond the first in the household, to a maximum of 4 children, see table 2.9. below. For households without children the housing benefit can at most constitute 15 per cent of the housing cost. Regardless of the income correction etc. the recipient of the housing benefit always has to pay minimum 20,200 dkr. in rents herself. Households with up to 3 children (with 4 children or more) can at most receive a housing grant of 35,580 dkr. (44,472 dkr.) per year.



Table 2.9. Various limits etc. for housing benefit, per year, 2007-2010

Age of the child	2007	2008	2009	2010
	----- dkr. -----			
Lower income deduction	120,200	122,500	124,600	128,800
Deduction increase per child	31,700	32,300	32,800	33,900
Own minimum payment	20,200	20,600	21,000	21,700
Maximum benenit, hhd.s				
With up to 3 children	35,480	36,264	36,876	38,124
With 4 or more children	44,472	45,336	46,095	47,652

2.3.7.2 Housing grant (*bho02_s*)

- *Definitions*

The unit of analysis is the household (*tu_bho_dk*)

- *Eligibility conditions*

Tenants who are pensioners (*poa00*>0 at the household level).

- *Income and wealth test*

The benefit is phased-out against total household income and wealth. The relevant incomes are the same as the one defined in the housing benefit section. The relevant differences are: only the part of incomes from children above 17,400 DKK per year is included in the relevant household income (table 2.10 below);



Table 2.10. Deductions in childrens incomes before deduction, 2007-2010

	-- dkr. --
2007	17,400
2008	18,000
2009	18,600
2010	19,300

The household income for the calculation of the housing grant is augmented to take account of financial wealth (see table below).

Table 2.11. Income augmentation with wealth for calculation of housing grant, 2007-2010

Year	Per cent	Wealth thresholds
2007	0	< 651,000
	10	651,000 – 1,302,100
	20	> 1,302,100
2008	0	671,800
	10	671,800 – 1,343,800
	20	> 1,343,800
2009	0	< 694,700
	10	694,700 – 1,389,500
	20	> 1,389,500
2010	0	< 722,500
	10	722,500 – 1,445,100
	20	> 1,445,100

- **Benefit amount**

The housing grant corresponds as a rule to 75 per cent of the housing with a supplement of 5,200 dkr. (in 2007). From this 22.5 per cent of the income that exceeds 123,700 dkr. (in 2007) is subtracted. This income threshold is augmented by 32,600 dkr. (in 2007) for each child in the household, up to a maximum of 4 children. The recipient of the housing benefit has to pay minimum 11 per cent of the income herself, or at least 13,100 dkr. (in 2007). Households with up to 3 children (with 4 children or more) can at most receive a housing grant of 36,612 dkr. (45,768 dkr.) per year.

Table 2.12. Various limits etc. for housing grant, per year, 2007-2010

Age of the child	2007	2008	2009	2010
	----- dkr. -----			
Lower income deduction	123,700	127,600	132,000	137,200
Deduction increase per child	32,600	33,600	34,800	36,200
Own minimum payment	13,100	13,500	14,000	14,500
Maximum benenit, hhd.s				
With up to 3 children	35,612	37,776	39,060	40,620
With 4 or more children	45,768	47,220	48,825	50,772



2.3.8 Basic old-age pension (*poa00_s*)

- *Definitions*

The unit of analysis is the individual (*tu_individual_dk*)

- *Eligibility conditions*

All persons from the age of 65, with conditions on citizenship and time of residence in Denmark.

- *Income test*

Above a threshold of 252,400 dkr. per year in her/his own earnings income, the benefit is withdrawn with 30 per cent, see table 2.13 below.

- *Benefit amount*

59,424DKK per year in 2007, see also table 2.13 below.

Table 2.13. Income threshold and benefit amount for basic old-age pension, per year, 2007-2010

	2007	2008	2009	2010
	----- dkr. -----			
Benefit amount	59,424	61,152	63,048	65,376
Income threshold	252,400	259,700	267,800	277,700

EUROMOD Notes: The citizenship and length of residence rules are not implemented in EUROMOD



2.3.9 Old-age pension supplement (*poa01_s*)

- **Definitions**

The unit of analysis is the individual (*tu_individual_dk*)

- **Eligibility conditions**

All persons from the age of 65, with conditions on citizenship and time of residence in Denmark.

- **Income test**

The relevant income concept for both own and spouse' income is earnings minus the labour market contribution. The rules differentiate between singles and couples and for the latter whether one or both partners are old-age pensioners. The rules do not distinguish between married and cohabitating couples.

For a single pensioner in 2007 the pension supplement is phased out against own (labour) income (after deduction of the labour market contribution, 8%) with 30 per cent, once the income surpasses a basic deduction of 55,700dkr. See also table below for other years.

For couples the incomes of both partners are taken into account. The relevant income measure for own income is again labour income after labour market contribution. For the partner's (labour) income, half of the income up to 174,300 dkr. is deducted beforehand.

For couples, income above a combined basic deduction of 111,800 dkr. (2007) is set off against the pension supplement with 15 per cent for two pensioner-couples and with 30 percent for one-pensioner couples.

Table 2.14. Income dependence parameters for old-age pension supplement, per year, 2007-2010

	2007	2008	2009	2010
Singles				
Deduction, own income (dkr)	55,700	57,300	59,100	61,300
Phase-out rate (%)	30	30	30	30,9
Couples				
Limit for calc. of spouse-income	174,300	179,400	185,000	191,800
Deduction, spouse' income (dkr)	111,800	115,000	118,600	123,000
Phase-out rate (per cent)				
<i>Couples, 1 old-age pensioner</i>	30	30	30	32
<i>Couples, 2 old-age pensioner</i>	15	15	15	16

- **Benefit amount**

27,936 DKK for married/cohabitants and 59,820 DKK for singles (in 2007).



Table 2.15. Benefits for old-age pension supplement, per year, 2007-2010

	2007	2008	2009	2010
	----- dkr. -----			
Singles	27,936	28,752	29,640	32,820
Married/cohabitants	59,820	61,560	63,468	67,896

2.3.10 Supplementary pension (*poa02_s*)

- *Definitions*

The unit of analysis is the individual (*tu_individual_dk*)

- *Eligibility conditions*

All old-age pensioners (age ≥ 65).

- *Income test*

The benefit is reserved for pensioners with liquid financial assets of less than 58,200DKK (see table below) and is phased-out against labour income above a basic deduction.

- *Benefit amount*

7,600 DKK per year (see table below).

Table 2.17. Benefit and asset test for supplementary pension, per year, 2007-2010

	2007	2008	2009	2010
	----- dkr. -----			
Benefit	7,600	7,800	10,300	10,700
Asset threshold	58,200	59,900	61,800	74,100

2.3.11 Personal Supplement rate (*poa02_s*)

The supplementary pension is also phased-out against incomes other than old-age incomes, such as labour income, using the personal supplement rate, which is calculated for all old-age pensioners based on their own and a possible spouse's income beyond the old-age pension. For own employment income a basic deduction of 30,000 dkr. applies.

As a default the supplement rate is 100 per cent (e.g. 100% of the benefit is paid), which is reduced for incomes above 16.100 dkr. (in 2007) for singles and above 31.800 dkr. for married cohabitant couples by 1 percentage point for every 396 dkr. (800 dkr. for couples) of other income. See also table below.



Table 2.16. Benefit and asset test for supplementary pension, per year, 2007-2010

	2007	2008	2009	2010
	----- dkr. -----			
Basic deduction				
Singles	16,100	16,600	17,100	17,700
Couples	31,800	32,700	33,700	34,900
Phase-out				
Singles	396	407	420	436
Couples	800	823	849	881

2.4 Social contributions

Most Danish transfers are financed through either the tax system, or through fully privately organized schemes. Below the three partly public social security schemes are described.

2.4.1 Supplementary labour market pension (*tscpier_s*, *tscpiee_s*)

All employees and employers pay contributions to a supplementary labour market pension scheme, with fixed contributions that vary by type of employment contract – monthly, fortnightly, weekly or hourly – and number of hours worked – full-time, part-time or less, see table 2.18 below. Employers pay two-third of the contribution (*tscpier_s*), while employees pay one-third (*tscpiee_s*). Self-employed can opt to pay the supplementary labour market pension as well.

Table 2.17. Supplementary labour market pension contributions, 2007-2010

	2007-2008	2009-2010
	----- dkr. -----	
Monthly contract		
Full time (117h-)	243.90	270
Part time (78-116h)	162.60	180
Part time (39-77h)	81.30	90
< 39 hours	0	0
Fortnightly contract		
Full time (54h-)	128.70	142.20
Part time (36-53h)	85.80	94.80
Part time (18-36h)	42.90	47.40
< 39 hours	0	0
Weekly contract		
Full time (27h-)	64.35	71.10
Part time (18-26h)	42.90	47.50
Part time (9-17h)	21.45	23.70
< 39 hours	0	0
Hourly paid		
Per hour	1.74	1.92

EUROMOD note: Only monthly contracts are simulated in Euromod, as the majority of contracts in Denmark are monthly.



2.4.2 Contribution to unemployment insurance scheme and early retirement scheme (*tyrui_s*)

Unemployment insurance is voluntary and organised through typically trade-specific insurance schemes with monthly contributions, see table below. Early retirement is conditional upon long-term membership of an unemployment insurance scheme, and contribution to early retirement is therefore modelled alongside contributions to unemployment insurance schemes with a total contribution (*tyrui_s*).

Table 2.18. Supplementary labour market pension contributions, 2007-2010

	2007	2008	2009	2010
Contribution to unemployment insurance scheme and early retirement scheme	773	785	798	822

EUROMOD note: Participation to unemployment insurance scheme is imputed using national register data.

2.4.3 Labour Market Contributions (*tsc_s*)

The labour market contribution (LMC) is a gross tax of 8 per cent levied upon gross labour income.

2.5 Personal income tax

The Danish tax system contains a gross flat tax levied on all labour income, municipal and county taxes levied on the taxable income base and three progressive tax rates at the national level levied on the personal income base. The tax system is mainly based on individual personal taxation, although there are a few possibilities for married couples to transfer redundant deductions in the different tax bases.

Two main income concepts used in this context are the Personal Income and Taxable Income, which are calculated as shown in the table below.



Table 2.19 Calculation of the Personal Income and Taxable Income tax bases

<p>(1) Gross labour income</p> <ul style="list-style-type: none"> - Contributions to supplementary pension scheme + Transfers <ul style="list-style-type: none"> Education grant (<i>Statens Uddannelsesstøtte</i>) Unemployment benefits (<i>Dagpenge</i>), Early retirement pensions (<i>Efterløn og Engangsydelse</i>), Social assistance (<i>Kontanthjælp og integrationsydelse</i>), Severance pay (<i>Fratrædelsesgodtgørelse</i>) Sickness benefits (<i>Sygedagpenge mv.</i>) Benefits to pensioners, including old-age pension (<i>folkepension</i>); heating subsidy (<i>varmehjælp</i>); pensions from the labour market contribution scheme (<i>ATP-pensioner</i>); civil servant pensions, incl. pensions to wife and children (<i>tjenestemandspensioner</i>); pension payments from privately held pension plans in pension funds, banks or insurance companies with regular payments; capital pensions; pension payments from previous employers; foreign pensions Survivors' benefits (<i>Efterladtepension</i>) Disability pension (<i>Revalideringsydelse mv.</i>) + Other incomes + Gifts + Alimony received + Life insurance premiums, fringe benefits + Multi media tax base (3.000 dkr.; from 2010) - Labour market contribution - Contribution to private pension schemes
<p>(2) Personal income</p> <ul style="list-style-type: none"> + Net capital income - Work-related deductions <ul style="list-style-type: none"> Earned income tax credit Transport allowance Payments to unemployment funds, unions & early retirement scheme Alimony/payments to divorcees' children and ex-partner Special occupational deductions (fishermen, etc.) Deposit on (company) start-up account Gift deductions Other employee expenses (over 5.200kr)
<p>(3) Taxable income</p>

EUROMOD Note: 1) It has not been possible to identify some of the components of these income concepts. Please have a look at the component of the income lists *il_persinc* and *il_taxinc* for more information. 2) The Danish tax system uses a concept of capital income, which incorporates interest payments on loans, mortgages etc. No fully comparable variable is found in the SILC-data, where the most close variable – investment income *yiy* – also includes a long range of positive incomes. For this reason, only negative investment incomes are included in the tax base. This option can be switched off in the model. 3) For commuting distances (forth and back) above 25km, tax payers can deduct standardized expenses (per km and work day). This is not implemented.



Another important feature of the tax system is the General Personal Allowance, used for the simulation of several of the instrument described below.

Table 2.20 General Personal Allowance

	2007	2008	2009	2010
	----- DKK -----			
General personal allowance				
- For persons below 18 years	29,300	30,600	32,200	32,200
- For all other tax payers	39,500	41,000	42,900	42,900

EUROMOD Notes: Due to the scarce practical relevance, the distinction between younger and older than 18 years old is not implemented in the current version of EUROMOD.

2.5.1 Earned Income Tax Credit:

- *Tax unit*

Tax unit is individual

Tax Allowances

Contribution to private pension schemes and contribution to supplementary labour market pensions needs to be deducted from the tax base

- *Tax Base*

The tax base is the gross labour income, after the deduction of the tax allowances

- *Tax Schedule*

In 2007 the earned income tax credit rate was of 2.5%. The maximum value of tax credit was of 7500 DKK per year.

Table 2.21. Benefit and asset test for supplementary pension, per year, 2007-2010

	2007	2008	2009	2010
	----- dkr. -----			
Rate	2.5	4.0	4.25	4.25
Maximum value	7,500	12,300	13,600	13,600

2.5.2 Municipality Tax:

- *Tax unit*

The tax unit is individual

- *Tax Base*

The tax base is the taxable income base after the deduction of the general personal allowance. Unused allowance can be transferred between spouses.



- *Tax Schedule*

Tax rates vary across municipalities, see table below.

Table 2.22. Distribution of municipality tax rates, 2007-2010

	2007	2008	2009	2010
	----- per cent -----			
Average	24.58	24.81	24.82	24.9
Minimum	22,32	22,80	22,80	22,80
Maximum	26,71	27,80	27,80	27,80

EUROMOD note: Since it is not possible to distinguish among municipalities in the SILC, the average tax rate is applied

2.5.3 Church Tax:

- *Tax unit*

The tax unit is individual

- *Tax Base*

The tax base is the taxable income base after the deduction of the general personal allowance. Unused allowance can be transferred between spouses.

- *Tax Schedule*

Tax rates vary across counties, see table below.

Table 2.22. Distribution of church tax rates, 2007-2010

	2007	2008	2009	2010
	----- per cent -----			
Average	0.88	0.88	0.88	0.89
Minimum	0,42	0,41	0,42	0,44
Maximum	1,5	1,5	1,5	1,5

EUROMOD note: The church tax is a voluntary contribution. In EUROMOD entitlement is randomly assigned to 68,2% of the municipality tax payers. Since it is not possible to distinguish among counties in the SILC, the average tax rate is applied

2.5.4 Health Contribution:

- *Tax unit*

The tax unit is individual

- *Tax Base*

The tax base is the taxable income base after the deduction of the general personal allowance. Unused allowance can be transferred between spouses.

- *Tax Schedule*

The tax rate is 8% between 2007 and 2010



2.5.5 Bottom Bracket Income Tax:

- *Tax unit*

The tax unit is individual

- *Tax Base*

The tax base is the personal income base and positive net capital income, with the general personal allowance subtracted. Spouses can transfer negative net capital income and any unused personal allowance between them for the calculation of the bottom bracket tax.

- *Tax Schedule*

The tax rates in 2007 was 5.48 per cent, see table 2.23.

Table 2.23. Bottom bracket tax rates, 2007-2010

	2007	2008	2009	2010
	----- per cent -----			
Bottom bracket tax rate	5.48	5.48	5.04	3.67

2.5.6 Medium Bracket Income Tax:

- *Tax unit*

The tax unit is individual

- *Tax Base*

The tax is levied upon the sum of the personal income tax base and positive net capital income, with the middle bracket tax allowance subtracted. For the calculation of the middle bracket tax spouses can transfer negative net capital income and any unused middle bracket tax allowance. The middle bracket tax has been abolished, applicable from the tax year 2010.

- *Tax Schedule*

Table 2.24. Middle bracket tax rates and allowances, 2007-2010

	2007	2008	2009	2010
	----- per cent -----			
Bottom bracket tax rate	6.0	6.0	6.0	-
Middle bracket tax allowance	272,600	279,800	347,200	-

2.5.7 Top Bracket Tax:

- *Tax unit*

The tax unit is individual



- *Tax Base*

The top-bracket tax is the highest-level of the three progressive state taxes and is levied upon the sum of the personal income tax base, positive net capital income and contribution to capital pension schemes, with the top-bracket tax allowance subtracted.

The net capital income for spouses for the calculation of the top-bracket tax is computed jointly and taxed for the spouse with the highest basis of calculation, i.e. the spouse with the highest sum of the personal income base and the contributions to private capital pensions.

From the tax year 2010, a basic yearly allowance of 40.000 dkr. is introduced for the inclusion of positive net capital income in the tax base for the top-bracket tax. The allowance can be transferred between spouses. This means that for two spouses only positive capital incomes above 80.000 dkr. (in 2010) are taxed with the top-bracket tax rate.

- *Tax Schedule*

Table 2.25. Top bracket tax rates and allowances, 2007-2010

	2007	2008	2009	2010
	----- per cent -----			
Top bracket tax rate	15.0	15.0	15.0	15.0
Top bracket tax allowance	327,200	335,800	347,200	389,900
Allowance in positive net capital income	-	-	-	40,000

The sum of municipal, health, bottom, middle and top tax could not exceed 59% (51.5% in 2010). If this happens, the top bracket income tax is reduced accordingly.

2.6 Property tax (tpr_s)

- *Tax unit*

The tax unit is the household

- *Tax Base*

The Tax base is the property value

- *Tax Schedule*

The tax rate is 1% up to a property value of 3,040,000 dkr. and a tax rate of 3 per cent above that threshold. The threshold has been frozen nominally since 2002.

EUROMOD Notes: In order to simulate this instrument, the tax rule has been reversed and the property value derived. This has then been used in the simulation.



3. DATA

3.1 General description

The Danish module of EUROMOD uses data from the European Union Statistics on Income and Living Conditions (EU-SILC) provided by Eurostat and contains almost 15,000 individuals from almost 6,000 households. The sampling is representative of all private households in Denmark.

Table 3.1 EUROMOD database description

EUROMOD database	
Original name	DK_2008_a1
Provider	Statistics Denmark
Year of collection	2008
Period of collection	March-July (interview part)
Income reference period	2007 (calendar year)
Sampling	Random probability sampling
Unit of assessment	Households
Coverage	Private households
Sample size	5778 households (14836 individuals)
Response rate	

The data sample is a representative sample of persons aged 16 years or older. From this sample the households are defined as persons who share expenses for daily living or share meal regularly. The data contains information on both the households and its members.

The data are compiled by Statistics Denmark. While information on the composition of the households, their living conditions, their view on their economic stance, their labour market status and their health status is collected through an interview survey (conducted between March and July), further information on income, education and housing are added from official registry data.

About 48 per cent of the interviews were conducted by telephone with the respondent herself, while another 49 per cent were conducted through interview with another member of the household. The remaining interviews were self-administered by the respondent.

The sampling is managed as a rotating panel, where 25 per cent of the sample is replaced each year. A given household is thus part of the sample for 4 continuous years.

While incomes in the EU-SILC are recorded in € and yearly, the derived EUROMOD-data are stated in Danish kroner (DKK) in monthly terms.

3.2 Sample quality and weights

3.2.1 Non-response

There is a non-response rate of almost 48 per cent from the sampling of 11,000 private households to the final sample of 5,778 households in the Danish part of the UDB EU-SILC-data. Statistics Denmark has not documented the reasons for non-response explicitly, but states that the general refusal of people to take part in interview surveys for research purposes poses a considerable problem. It is possible for citizen to register for this so-called ‘researcher-protection’ with the national registration office.



The non-response is counteracted through the modification of weights, see first bullet in the next section.

3.2.2 Weights

The dataset includes four types of cross-sectional survey weights, which all have been modified to reproduce population characteristics from the sample:

- The household cross-sectional weights (variable **DB090**) form the background for the EUROMOD weight-variable **dwt**. The weights have been corrected for household non-response in order to calibrate the sample to the survey population, taking account of the population distribution in the following categories:
 - Highest attained education
 - Sector of employment
 - Gender
 - Age
 - Income
 - Number of household members
 - Type of household
 - Regional distribution of population
- The personal cross-sectional weights for all household members of all ages (variable **RB050**) is used to draw inference on individual basic demographic variables for the population of all individuals living in private households. Because all the current members of any selected household (which has responded to the interview) are surveyed, the personal weights RB050 are equal to the household weights DB090.
- The personal cross-sectional weights (variable **PB040**) for all household members who were interviewed individually (aged 16 and over) is used to draw inference on the variables included in the personal questionnaire. These weights had to be corrected for individual non-response.
- The personal cross-sectional weights for the selected respondents (variable **PB060**) are equal to PB040 for the selected respondents.

Table 3.2 Descriptive Statistics of weights

	DB090	RB050	PB040	PB060
Number	14836	14836	11545	5778
Mean	365.840	365.840	377.796	754.873
Median	305.646	305.646	303.546	699.245
Maximum	3652.146	3652.146	3652.146	4208.553
Minimum	1.258	1.258	1.258	7.549
Max/Min	2903.137	2903.137	2903.137	557.498
Decile 1	129.219	129.219	132.231	375.844
Decile 9	660.533	660.533	722.967	1211.294
Dec 9 / Dec1	5.112	5.112	5.467	3.223

Notes: The weight **dwt** in the EUROMOD-data is equal to DB090.



3.3 Data adjustment

To accommodate the modelling of tax and benefit rules using the EU-SILC-data, a few variables had to be adjusted.

3.3.1 Other income - *yot*

There are seven observations with negative *yot*, which should cover incomes received by people under 16. As there is no obvious reason for negative incomes of this kind, the 7 cases with $yot < 0$ have been recoded to zero.

3.4 Imputations and assumptions

3.4.1 Time period

The used EU-SILC-data for 2008 is based on survey data from interviews conducted March-July 2008 combined with registry data from the calendar year 2007 on incomes, dwelling information and educational information.

The input registry data on incomes are aggregated annual numbers, but are for use in EUROMOD converted into monthly records, thus implicitly assuming a regular flow of income throughout the year. However, a number of variables in the data that record the number of month with different income types, sum as *yemmy* = “Month of employment (income)” or *bunny* = “Month of unemployment benefit income”.

3.4.2 Gross incomes

The income variables in the Danish SILC-data only contain gross incomes. Net-to-gross conversions have therefore not been necessary.

3.4.3 Other imputed variables

The aggregated construction of a number of especially income variables in the EU-SILC UDB-data have necessitated the splitting of UDB-variables and/or the imputation of individual benefits. Some key examples are:

Both unemployment benefits, social assistance and early retirement benefits are recorded in the UDB-variable PY090G (*bun*).

- Early retirement benefit (*pyr*) is split by use of the age of the recipient and the size of the benefit.
- Actual unemployment benefits (*bunct*) are imputed from the recipients age and the size of the benefits.
- Social assistance benefit (*bsa*) is split by wealth eligibility, recipients’ provider status, whether the person is living with parents and age

Various forms of public pension transfers as well as income from private pension schemes are recorded in the UDB-variable PY100G.



- The basic old-age pension (poa00) is imputed from age, other incomes and numbers of years lived in Denmark.
- The pension supplement (poa01) is imputed from age and own as well as spouse income.
- The supplementary pension benefit (poa02) is imputed from income and wealth.
- The supplementary labour market pension (poa03) is imputed from external information on average incomes of this type and assumptions on lifetime work history.
- The remaining part of PY100G is recorded as payments from private pension schemes. It will however be an amalgam of a heating subsidy, civil servant pensions, income from private pension plans, pensions from previous employers, capital pension disbursements and foreign pensions.

A tax free child family grant varying by age of child (bfachnm) is imputed based on age of child and isolated from other child benefits (bfach00 and bfached) in the family/children related allowances (HY050G/bfa). Residual child-related benefits are saved in bfachot.

Housing allowances (HY070G) are split by the age of the recipient into a housing benefit (bho01) for recipient below the age of 65 and a housing grant (bho02) for pensioners.

The receipt of housing allowances is based on the concept of housing costs, including rent, but not heating etc. Under some circumstances related both to characteristics of the dwelling and of the tenancy that cannot be simulated, the housing cost is augmented. To establish this base for the computation of the housing allowances, the housing costs is imputed hence by reversing the rules for the housing allowances, creating the housing cost base for housing benefits (xhc01) and for housing grants (xhc02). The variable xivhc is then imputed for all the household in sample using predictions of xhc01 on and xhc02 on the basis of household characteristics and SILC reported housing cost.

To simulate the receipt of unemployment benefit (see also section 2.3.1), the participation to the unemployment insurance scheme is simulated in the 0/1-variable lrg, based on a discrete choice model established from Danish registry data.

As SILC does not contain informations on the value of owned property, the value of property owned (aiv) is imputed from the paid property taxes.

The previous earnings (yempv) on which the level of unemployment benefit is based is calculated by reversing the rules for the unemployment benefit.

3.5 Updating

In the current version of EUROMOD for Denmark, the model is run using EU-SILC UDB data 2008, where various personal information is for 2008, but income data stem from the calendar year 2007 (see also section 3.4.1). For simulations employing policy systems 2008-2010 the income data are updating using the factors reported in table 3.3.



Table 3.3 Updating factors

Index	Income Source/index type	2007- 2008	2007- 2009	2007- 2010	Source
<i>default</i>	Consumer Price Index	1.034	1.048	1.072	1
<i>yivwg</i>	INCOME : Wage/Salary	1.042	1.065	1.089	2
<i>yempv</i>	INCOME : Employment : Previous	1.044	1.087	1.112	2
<i>yem</i>	INCOME : Employment	1.042	1.065	1.089	3
<i>ypp</i>	INCOME : Private Pension	1.034	1.048	1.072	1
<i>yse</i>	INCOME : Self Employment	1.042	1.065	1.089	2
<i>yy</i>	INCOME : Investment	0.762	0.567	0.753	4
<i>ypr</i>	INCOME : Property	1.029	1.025	1.037	5
<i>yprrt</i>	INCOME : Property : Rent	1.029	1.025	1.037	5
<i>ypt</i>	INCOME : Private Transfers	1.042	1.065	1.089	3
<i>yot</i>	INCOME : Other	1.042	1.065	1.089	3
<i>yds</i>	INCOME : Disposable	0.996	1.014	1.037 ³	6
<i>bed</i>	BENEFIT/PENSION : Education	1.029	1.061	1.100	7
<i>bun</i>	BENEFIT/PENSION : Unemployment	1.029	1.061	1.100	7
<i>bunct</i>	BENEFIT/PENSION : Unemployment : Contributory	1.029	1.061	1.100	7
<i>bunot</i>	BENEFIT/PENSION : Unemployment : Other	1.029	1.061	1.100	7
<i>bhl</i>	BENEFIT/PENSION : Health	1.029	1.061	1.100	7
<i>bfa</i>	BENEFIT/PENSION : Family	1.029	1.061	1.100	7
<i>bfach00</i>	BENEFIT/PENSION : Family : Ordinary child benefit & supplement	1.029	1.061	1.100	7
<i>bfached</i>	BENEFIT/PENSION : Family : Child benefit to student parents	1.029	1.061	1.100	7
<i>bfachnm</i>	BENEFIT/PENSION : Family : Child family grant	1.029	1.061	1.100	7
<i>bfachot</i>	BENEFIT/PENSION : Family : Residual benefits	1.029	1.061	1.100	7
<i>bsa</i>	BENEFIT/PENSION : Social Assistance	1.029	1.061	1.100	7
<i>bho01</i>	BENEFIT/PENSION : Housing:01	1.029	1.061	1.100	7
<i>bho02</i>	BENEFIT/PENSION : Housing:02	1.029	1.061	1.100	7
<i>pdi</i>	BENEFIT/PENSION : Disability	1.029	1.061	1.100	7
<i>poa</i>	BENEFIT/PENSION : Old Age	1.029	1.061	1.100	7
<i>poa00</i>	BENEFIT/PENSION : Old Age: Main/Basic	1.029	1.061	1.100	7
<i>poa01</i>	BENEFIT/PENSION : Old Age: Supp. benefit	1.029	1.061	1.100	7
<i>poa021</i>	BENEFIT/PENSION : Old Age: Supplementary Labour Market Pension	1.029	1.061	1.100	7
<i>poa03</i>	BENEFIT/PENSION : Old Age: Supplementary Additional Benefit	1.029	1.061	1.100	7
<i>psu</i>	BENEFIT/PENSION : Survivors	1.029	1.061	1.100	7
<i>pyr</i>	BENEFIT/PENSION : Early Retirement	1.029	1.061	1.100	7
<i>bma</i>	BENEFIT/PENSION : Maternity	1.029	1.061	1.100	7
<i>tpr</i>	TAX : Property tax	0.7622 8	0.567	0.753	4
<i>tis</i>	TAX: Income Tax and SIC	1.034	1.048	1.072	1
<i>kfb</i>	IN KIND : Fringe Benefit	1.042	1.065	1.089	2
<i>kivho</i>	IN KIND : Imputed value : Housing	1.024	1.054	1.084	9
<i>afc</i>	ASSETS : Financial Capital	0.762	0.567	0.753	10
<i>aiv</i>	ASSETS: Imputed property value	0.762	0.567	0.753	10
<i>xmp</i>	EXPENDITURE : Maintenance Payment	1.029	1.061	1.100	7
<i>xpp</i>	EXPENDITURE : Private Pension (voluntary)	1.042	1.065	1.089	2
<i>xhc</i>	EXPENDITURE : Housing cost	1.039	1.057	1.098	9
<i>xhc01</i>	EXPENDITURE : Housing cost	1.039	1.057	1.098	9

³ CPI growth rate applied due to missing information



<i>xhc02</i>	EXPENDITURE : Housing cost	1.039	1.057	1.098	9
<i>xivhc</i>	EXPENDITURE : Imputed housing cost	1.039	1.057	1.098	9
<i>xhcmomi</i>	EXPENDITURE : Housing cost : Mortgage Interest Payment	1.029	1.025	1.037	5
<i>xhcot</i>	EXPENDITURE : Housing cost : Other	1.029	1.025	1.037	5
<i>xhcrt</i>	EXPENDITURE : Housing cost : Rent	1.029	1.025	1.037	5
	EXPENDITURE : Housing cost : Mortgage Payment (interest+capital) : Mortgage Interest				5
<i>xhcmomi</i>	EXPENDITURE : Housing cost : Mortgage Interest	1.029	1.025	1.037	5
<i>xhcot</i>	EXPENDITURE : Housing cost : Other	1.029	1.025	1.037	5

Sources:

- 1 - Danish Consumer Price Index, year average, Statistics Denmark, www.statistikbanken.dk, PRIS08
- 2 - Wage Index for the Private Sector, yearly change from November to November, Seasonally adjusted, Statistics Denmark, [StatBank Denmark](#), ILON2
- 3 - Wage Index for the Private Sector, yearly change from November to November, Seasonally adjusted, Statistics Denmark, [StatBank Denmark](#), ILON3
- 4 - Share price index, Danish Stock exchange, ultimo year, Statistics Denmark, [StatBank Denmark](#) MPK13
- 5 - Construction costs index, Statistics Denmark, [StatBank Denmark](#), BYG5
- 6 - Increase in average disposable household income, Statistics Denmark, [StatBank Denmark](#), INDKF32
- 7 - [Satsreguleringsprocenten](#) (adjustment of rates index), Økonomistyrelsen
- 8 - The tax base for the Danish property tax is currently nominally fixed at 2001-levels.
- 9 - Consumer Price Index, Rent, yearly change from december to december, Statistics Denmark, [StatBank Denmark](#), PRIS6 (husleje)
- 10 - Share price index, Danish Stock exchange, ultimo year, Statistics Denmark, [StatBank Denmark](#), MPK13



4. VALIDATION

To validate the results from model runs and point to possible pitfalls the following presents a range of validation tables and comments of EUROMOD and the underlying input data (EM-data) with external statistical information. Where possible publicly assessable statistics, typically from StatBank Denmark, are used for the external statistics, to insure that all users can replicate the validation.

4.1 Aggregate Validation

Table 4.1. presents an overall comparison of the contents of the SILC-variable on household disposable income (HY020) and the corresponding simulated income aggregate from EUROMOD (ils_dispy). Overall there is a quite close correspondence between the two concepts.

Table 4.1 Components of disposable income

	EUROMOD [year]	EU-SILC [year]
	ils_dispy	HY020
Employee cash or near cash income	*	*
Employer's social insurance contribution	-	-
Contributions to individual private pension plans	-	-
Cash benefits or losses from self-employment	-	*
Pension from individual private plans	-	-
<i>Unemployment benefits</i>	*	*
<i>Old-age benefits</i>	*	*
<i>Survivor' benefits</i>	*	*
Sickness benefits	*	*
Disability benefits	*	*
Education-related allowances	*	*
Income from rental of a property or land	*	*
<i>Family/children related allowances</i>	*	*
Social exclusion not elsewhere classified	-	*
Housing allowances	*	*
Regular inter-household cash transfer received	-	*
Interests, dividends, etc.	*	*
Income received by people aged under 16	*	*
Regular taxes on wealth ¹	-	*
<i>Regular inter-household cash transfer paid</i>	*	*
<i>Tax on income and social contributions</i>	*	*
<i>Repayments/receipts for tax adjustment</i>	-	*

¹ Not applicable in Denmark.

Notes: Contents of HY020 are based on EUROSTAT (2010).



4.1.1 Validation of incomes inputted into the simulation

The number of employed in the SILC-data compares quite well with external information, see table 4.2.

The number of unemployed, on the other hand, is far larger according to the SILC-data than in the external statistics, which may be due to the differences in computation. EM-figures are number of employed and unemployed based on months in employment/unemployment. Numbers are computed as averages of monthly data over the year. The external figures are an inventory as of end of November. As employment typically spans over longer periods than unemployment, the inventory in November of employed and unemployed will match the computation of month spend in employment/unemployment better for employment than for unemployment.

Table 4.2 Number of employed & unemployed (1,000)

	Input dataset (I)	External Source (II)				Ratio (I/II)			
	2007	2007	2008	2009	2010	2007	2008	2009	2010
Number of employed	2.639	2779	2823	2747	2687	0.95	0.93	0.96	0.98
Number of unemployed	234	115	99	177	218	2.03	2.36	1.32	1.07

Notes: Part of the reduction in the number of employed from 2009 to 2010 is due to a change in the form of registration, according to Statistics Denmark.

Sources: StatBankDenmark (AKU21).

The income information in the SILC-data is almost exclusively based on official registers and therefore not prone to misreporting errors. Therefore the number of persons with employment income in the EM-data quite closely matches the external statistics, as does investment income and private pension income (table 4.3.).

The deviation for fringe benefits is also deemed to stem from differences in the definition of what constitutes fringe benefits.

Table 4.3 Market Income - Number of recipients (1.000)

	Input database (I)	External Source (III)				Ratio (I/III)			
	2007	2007	2008	2009	2010	2007	2008	2009	2010
Original income									
Employment income	2,953	3,005	2,978	2,936	2894	0.98	0.99	1.01	1.02
Self-employ. income	794	507	484	508	489	1.57	1.05	0.95	1.04
Investment income	4005	3,918	3,974	3,606	3347	1.02	1.01	1.11	1.20
Private pension income	450	409	439	466	495	1.10	1.03	0.97	0.91
Property income ¹	85	-	-	-	-	-	-	-	-
Other income ¹	252	-	-	-	-	-	-	-	-
Private transfers ¹	147	-	-	-	-	-	-	-	-
In-kind income									
Fringe benefits	240	1,889	1,694	1,697	1856	0.13	0.14	0.14	0.13

¹ No comparable external statistics found.

Notes: External figure for investment income is number of persons receiving interest income. External figure for private pension income is “other pension income”, once all public pensions are accounted for.

Sources: StatBankDenmark (INKP1, INKP4).

Table 4.4 compares market income against external statistics. Both for the mean and the total of employment income, EUROMOD performs quite well in all years. Self-employment income and investment income show an underestimation in EUROMOD for the base year 2007. This deviation is reduced for self-employment income in the following policy years.



Table 4.4 Market Income - Aggregate amounts (DKK)

	Input (I)	External source (III)	Ratio (I/III)	Uprated input (I)			External source (III)			Ratio(I/III)		
	2007	2007	2007	2008	2009	2010	2008	2009	2010	2008	2009	2010
Original income												
Employment income – mean	21,532	22,510	0.96	22,433	22,941	23,450	23,672	23,515	24,479	0.95	0.98	0.96
Employment income – total (mill.kr.)	763,039	768,889	0.99	794,948	812,984	831,019	808,514	801,221	819,942	0.98	1.01	1.01
Self-employment income (mill.kr.)	66,322	81,564	0.81	69,095	70,663	72,231	80,120	71,231	73,002	0.86	0.99	0.99
Investment income (mill.kr.)	31,996	37,338	0.86	24,386	18,147	24,084	20,865	14,957	22,246	1.17	1.21	1.08
In-kind income												
Fringe benefits (mill.kr.)	4,403	8,085	0.54	4,587	4,691	4,796	8,138	8,297	9,651	0.56	0.57	0.50
Property income (mill.kr.)	1,113	-	-	1,145	1,140	1,154	-	-	-	-	-	-

Notes:

Sources: StatBankDenmark (INDKP4).

Table 4.5 Non-simulated taxes and benefits - Number of recipients/payers (1,000)

	Input database (I)	External Source (III)				Ratio (I/III)			
	2007	2007	2008	2009	2010	2007	2008	2009	2010
Pensions									
Supplementary labour market pension	713	665	697	731	770	1.07	1.02	0.97	0.93
Benefits									
Disability pension ¹	357	248	246	247	250	1.44	1.45	1.45	1.43
Education benefit	379	305	307	327	364	1.24	1.23	1.16	1.04
Survivors' help	36	338	327	292	246	0.11	0.11	0.12	0.15
Sickness benefit	406	468	449	441	427	0.87	0.90	0.92	0.95
Early retirement benefit	204	182	183	179	173	1.12	1.12	1.14	1.18

¹ In the external statistics, people receiving disability pension are counted as of January 1st.

² The number of land value tax payer is assumed to be equal to the number of property value tax payers.

Sources: StatBankDenmark (SOC DAG00, PSKAT3, PEN11, KONT3, KONT4, INDKP1), jobindsats.dk and own calculations using register data.



The deviation for fringe benefits is deemed to stem from differences in the definition of what constitutes fringe benefits.

Table 4.5. summarizes some of the pensions and other benefits that enter EUROMOD through the input data, but which are not simulated by the model. The number of disability pension recipients is overestimated in the input data, which may in part be due to the fact that the external data only counts recipients as of January 1st, while the input data even contains and counts persons who are recipients for part of the year.

The number of recipients of survivor's help is severely underestimated in the input database.

Table 4.6 reports a comparison of the aggregate amounts for non-simulated taxes and benefits with external statistics. As was the case for the number of recipients of disability pensions, the aggregate sum of disbursed disability pensions is severely overestimated in the input data.

The opposite is the case for the early retirement benefit, for which the number of recipients is acceptably well represented in the input database (see table 4.5), while the aggregate disbursed amount is underestimated.

Over the four policy years studied, 2007-2010, it can be seen that the fit of the sickness benefits recorded in 2007 deteriorates over time, as the number of recipients in the external statistics falls. The converse is true of the education benefit, which starts out with an overestimation in 2007 due to a higher recorded numbers of recipients in the input database. As the true recorded number of recipients increases over time, the input database information converges to the external statistics.

4.1.2 Validation of outputted (simulated) incomes

For the benefits, taxes and social contributions that are simulated by EUROMOD, the simulated numbers of recipients/payers are compared to external comparable statistics in table 4.7. For the major part of the benefits, taxes and social contributions, the modelling fits the external statistics reasonably well.

A change in the eligibility rules for housing benefit and grant may accommodate for the divergence between the external statistics and the EUROMOD-simulations. According to the rules applicable in 2007-2010 – and thus in the EUROMOD-simulations – the housing grant applies to old-age pensioner-tenants, while the housing benefit applies to tenants under 65 years of age. However, in the external statistics the housing grant also encompasses disability pensioners (i.e. non-pensioners) who are entitled to it following rules valid until 2003. This means that the external numbers for the housing grant are inflated by these 'old' disable pensioners relative to the simulations based on the age-dependent imputation from the 2007-input data. Likewise, the external data for the housing benefit are 'deflated' by these 'old-rule' disability pensioners, compared to the simulations.

Insufficient information on the underlying data implies that EUROMOD cannot fully simulate the unemployment benefit and has to use the number of recipients in the 2007 SILC-data as a base for simulations also in the subsequent years. The simulations therefore cannot reflect the initial fall and subsequent rise in the number of recipients of unemployment benefit.

For most of the simulated taxes and benefits there is an acceptable fit of the EUROMOD simulations with external statistics, see table 4.8.

As is the case for the number of recipients also the aggregate amounts of disbursed housing benefits are overestimated by EUROMOD.



The aggregate amount of disbursed unemployment benefits shows an increasing divergence with time, as unemployment soared in the wake of the financial/economic crisis setting in 2007 and 2008.

Table 4.6 **Non-simulated** taxes and benefits - **Aggregate amounts (mill. DKK)**

	Input database (I)	External source (III)	Ratio (I/III)	Uprated input (I)			External source (III)			Ratio(I/III)		
	2007	2007	2007	2008	2009	2010	2008	2009	2010	2008	2009	2010
Pensions												
Supplementary labour market pension	6,548	6,782	0.97	6,738	6,946	7,203	7,688	8,424	9,131	0.88	0.82	0.79
Benefits												
Disability pension	47,082	16,169	2.91	51,273	55,836	60,806	17,176	18,649	20,585	2.99	2.99	2.95
Education benefit	13,432	10,094	1.33	13,821	14,250	14,777	10,459	11,693	13,555	1.32	1.22	1.09
Survivors' help	2,007	3,390	0.59	2,186	2,380	2,592	3,563	3,036	2,627	0.61	0.78	0.99
Sickness benefit	15,570	14,011	1.11	16,956	18,465	20,108	14,435	14,761	14,871	1.17	1.25	1.35
Early retirement benefit	4,713	20,211	0.23	4,849	5,000	5,185	21,486	21,042	20,865	0.23	0.24	0.25

Notes:

Sources: StatBankDenmark (SOC DAG00, SKAT, PEN22, KONT3, KONT4, INDKP1), jobindsats.dk and own calculations using register data


 Table 4.7 **Simulated** taxes and benefits - **Number of recipients** (1.000 persons)

	Input data	EUROMOD (II)				External source (III)				Ratio (II/III)			
	(I)	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Benefits													
Ord. & suppl. child benefit ³	142	214	214	214	214	235	234	236	234	0.91	0.91	0.91	0.91
Benefit for student parents ⁴	0.220	0.22	0.22	0.22	0.22	-	-	-	-	-	-	-	-
Child family grant ³	657	1,193	1,193	1,193	1,193	1200	1203	1208	1203	0.99	0.99	0.99	0.99
Housing benefit ²	399	568	567	563	566	560	184	188	203	3.01	3.08	3.00	2.79
Housing grant ²	265	244	247	250	247	317	311	304	299	0.77	0.80	0.82	0.83
Green check ⁵	-	-	-	-	3,510	-	-	-	-	-	-	-	-
Social assistance ⁶	491	137	137	137	137	141	142	165	172	0.97	0.96	0.83	0.80
Unemployment benefit	275	275	275	275	275	233	198	288	320	1.18	1.39	0.96	0.86
Old-age pension & suppl. ¹	834	840	840	840	840	851	867	884	921	0.99	0.97	0.95	0.91
Suppl. pension benefit ⁴	306	307	325	340	336	-	-	-	-	-	-	-	-
Taxes													
Church tax	-	2,798	2,798	2,798	2,804	3,431	3,406	3,381	3,407	0.82	0.82	0.83	0.82
Health contribution	-	4,093	4,094	4,092	4,101	4,140	4,142	4,125	4,150	0.99	0.99	0.99	0.99
Earned income tax credit ⁴	-	3,153	3,153	3,153	3,153	2,822	2,858	2,802	2,685	1.12	1.10	1.13	1.17
Bottom-bracket tax	-	4,135	4,135	4,135	4,135	4,161	4,168	4,148	4,175	0.99	0.99	1.00	0.99
Medium-bracket tax	-	1,137	1,183	599	0	1,217	1,286	629	0	0.93	0.92	0.95	-
Top-bracket tax	-	841	880	850	630	953	1,003	928	651	0.88	0.88	0.92	0.97
Municipality tax	-	4,093	4,094	4,092	4,101	4,126	4,118	4,106	4,154	0.99	0.99	1.00	0.99
Property value tax	1,535	1,535	1,535	1,535	1,535	2,040	2,060	2,066	2,073	0.75	0.75	0.74	0.74
Social insurance contributions													
Labour market contribution	-	3,177	3,177	3,177	3,177	3,095	3,099	3,058	3,006	1.03	1.03	1.04	1.06
Suppl. lab. market contrib.	-	2,679	2,679	2,679	2,679	3,045	3,066	3,031	3,045	0.88	0.87	0.88	0.88
Contr. to unempl.insurance and early retirement scheme	-	1,637	1,637	1,637	1,637	2,206	2,191	2,200	2,206	0.74	0.75	0.74	0.74

¹ In the external statistics no separate figure is available for the pension supplement, which is income-dependent and is given to a subgroup of the old-age pensioners.

² Number of families/households; ³ Number of children; ⁴ The number of earned income tax credit recipients is equal to the number employed;

⁵ No suitable external statistics found; ⁶ Number of people living in household with at least one recipient;

Sources: StatBankDenmark (BOST11, BOST33, BTS55, INDKP1, PSKAT3, RAS3, PEN33) and own calculations using register data


 Table 4.8 **Simulated** taxes and benefits - **Aggregate amounts** (mill. DKK, annual)

	Input data (I)					EUROMOD (II)				External source (III)				Ratio (II/III)		
	2007	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010			
Benefits																
Ord. & suppl. child benefit	1,339	1,581	1,627	1,677	1,738	1,418	1,480	1,559	1,625	1.11	1.10	1.08	1.07			
Benefit for student parents ¹	1	1	1	1	1	-	-	-	-	-	-	-	-			
Child family grant	12,527	13,347	13,602	14,234	14,719	13,254	14,001	14,284	14,656	1.01	0.97	1.00	1.00			
Housing benefit	4,833	5,969	6,137	6,189	6,512	2,529	2,504	2,590	2,865	2.36	2.45	2.39	2.27			
Housing grant	5,926	5,711	6,127	6,282	6,416	8,450	8,577	8,747	8,994	0.68	0.71	0.72	0.71			
Green check	0	0	0	0	4,762	-	-	-	4,967	-	-	-	0.96			
Social assistance	5,205	8,540	8,774	9,077	9,406	7,990	7,347	8,304	9,034	1.07	1.19	1.09	1.04			
Unemployment benefit	6,216	6,216	6,487	6,758	6,912	11,235	7,730	15,442	20,617	0.55	0.84	0.44	0.34			
Old-age pension & suppl. ²	81,812	84,288	86,701	89,415	94,463	77,139	80,682	84,287	92,132	1.09	1.07	1.06	1.03			
Suppl. pension benefit ¹	1,892	2,075	2,254	3,113	3,208	-	-	2,270	-	-	-	1.37	-			
Taxes																
Church tax	-	4,363	4,512	4,626	4,845	5,167	5,218	5,146	5,602	0.84	0.86	0.90	0.86			
Health contribution	-	57,807	59,800	61,317	63,461	56,739	57,883	57,360	62,664	1.02	1.03	1.07	1.01			
Earned income tax credit	-	16,264	26,876	29,474	29,774	16,543	27,523	29,286	28,892	0.98	0.98	1.01	1.03			
Bottom-bracket tax	-	45,552	47,339	44,437	33,532	46,415	48,592	44,294	34,343	0.98	0.97	1.00	0.98			
Medium-bracket tax	-	8,702	9,392	5,739	0	9,098	9,908	5,233	0	0.96	0.95	1.10	-			
Top-bracket tax	-	18,285	19,362	19,697	17,036	17,882	19,081	16,917	16,308	1.02	1.01	1.16	1.04			
Municipality tax	-	177,614	185,455	190,237	197,522	174,038	178,889	177,311	193,829	1.02	1.04	1.07	1.02			
Property value tax	11,707	11,707	8,866	6,581	8,754	11,729	12,137	12,381	12,638	1.00	0.73	0.53	0.69			
Social insurance contributions																
Labour market contribution	-	66,349	69,124	70,692	72,260	68,331	71,655	70,344	72,241	0.97	0.97	1.00	1.00			
Suppl. lab. market contrib. ³	6,548	6,774	6,775	7,499	7,499	7,726	7,687	8,590	-	0.88	0.88	0.87	-			
Contr. to unempl.insurance and early retirement scheme	-	15,037	15,273	15,526	15,992	24,360	24,721	24,336	24,909	0.62	0.62	0.64	0.64			

¹ No suitable external statistics found (for all years).

² In the external statistics no separate figure is available for the pension supplement, which is income-dependent and is given to a subgroup of the old-age pensioners.

³ External statistics for 2010 not yet available.

Sources: StatBankDenmark (INDKP1, PSKAT1, PEN22, BOST44, BOST22) and own calculations using register data (for suppl. labour market contribution, unemployment benefit contribution and early retirement pension contribution.)



4.2 Income distribution

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

4.2.1 Income inequality

A comparison of distributional indicators derived from EUROMOD-generated household disposable income with external statistics shows that EUROMOD overestimated incomes for the lower deciles, while underestimating incomes for higher deciles of the income distribution. These divergences also cause an underestimation of the Gini-coefficient and an overestimation of the S80/S20-ratio.

Comparing EUROMOD based indicators with SILC based ones, no relevant discrepancies emerges, with the exception of an overestimation of the income share of the first decile of the income distribution

4.2.2 Poverty rates

A computation of poverty rates by gender and age using EUROMOD shows that EUROMOD underestimates the incidence of poverty in Denmark according to comparable calculations using other registry data (table 4.10). This underestimation is larger for the lower poverty lines, such as 40% of median household disposable income (HDI), while the poverty rates only diverge slightly from the external figures for 70% of HDI. This indicates that it is the overestimation of incomes in the lower deciles mentioned in relation to table 4.9 which also biases EUROMODs results for poverty incidence.

A comparison of the results with SILC based poverty rates shows a better matching, even if EUROMOD tends to underestimate poverty rates in this case as well.



Table 4.9 Income distribution

Indicator	EUROMOD (I)				External Source (II)				Ratio (I/II)				SILC(III)	Ratio (I/III)
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010	2007	2007
Decile shares														
1	4.3	4.4	4.4	4.4	0.7	0.8	0.9	-	6.16	5.47	4.94	-	3.574	1.20
2	5.9	6.0	6.0	6.0	4.4	4.3	4.3	-	1.35	1.40	1.40	-	5.962	1.00
3	6.9	6.9	7.0	6.9	5.3	5.2	5.3	-	1.30	1.33	1.32	-	6.961	0.99
4	7.8	7.9	8.0	7.9	6.4	6.4	6.4	-	1.22	1.24	1.25	-	7.939	0.98
5	8.7	8.8	8.9	8.8	8.0	8.0	7.9	-	1.09	1.10	1.13	-	8.832	0.98
6	9.5	9.7	9.8	9.6	9.6	9.6	9.6	-	0.99	1.01	1.02	-	9.729	0.98
7	10.4	10.6	10.7	10.6	11.5	11.5	11.5	-	0.91	0.92	0.93	-	10.656	0.98
8	11.5	11.7	11.8	11.7	13.6	13.6	13.7	-	0.84	0.86	0.86	-	11.756	0.98
9	13.1	13.3	13.4	13.4	16.0	16.1	16.3	-	0.82	0.82	0.83	-	13.461	0.97
10	21.8	20.7	20.0	20.8	24.5	24.5	24.2	-	0.89	0.85	0.82	-	21.13	1.03
Median	179,209	187,590	195,187	204,007	183,309	191,244	191,368	-	0.98	0.98	1.02	-	180,015	1.00
Mean	196,885	202,899	209,045	221,674	208,508	217,481	219,248	-	0.94	0.93	0.95	-	193,939	1.02
Gini	0.248	0.238	0.231	0.239	0.278	0.276	0.258	-	0.89	0.86	0.90	-	0.251	0.99
S80/S20	3.41	3.29	3.19	3.30	3.11	3.16	3.16	-	1.10	1.04	1.01	-	3.627	0.94

Notes: Based on household disposable income (HDI) equivalised by the “modified OECD” equivalence scale. HDI are calculated as the sum of all income sources of all household members net of income tax and social insurance contributions; computed at the individual level. External figures for 2010 were still not available.

Sources: Registry data.



Table 4.10 At risk of poverty rates by gender and age

Indicator	EUROMOD (I)				External Source (II)				Ratio (I/II)				SILC(III)	Ratio (I/III)
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010	2007	2007
40% median HDI														
Total	0.021	0.021	0.022	0.022	0.051	0.055	0.058	-	0.412	0.382	0.379	-	0.036	0.583
Males	0.027	0.027	0.027	0.028	0.054	0.058	0.063	-	0.500	0.466	0.429	-	0.041	0.659
Females	0.015	0.015	0.016	0.016	0.049	0.051	0.053	-	0.306	0.294	0.302	-	0.032	0.469
50% median HDI														
Total	0.046	0.045	0.044	0.045	0.083	0.090	0.085	-	0.554	0.500	0.518	-	0.062	0.742
Males	0.052	0.050	0.050	0.050	0.083	0.088	0.089	-	0.627	0.568	0.562	-	0.064	0.813
Females	0.040	0.040	0.039	0.039	0.083	0.091	0.081	-	0.482	0.440	0.481	-	0.06	0.667
60% median HDI														
Total	0.106	0.110	0.109	0.104	0.144	0.148	0.144	-	0.743	0.743	0.757	-	0.118	0.907
Males	0.104	0.108	0.106	0.102	0.129	0.134	0.132	-	0.806	0.806	0.803	-	0.117	0.889
Females	0.110	0.111	0.110	0.106	0.159	0.162	0.155	-	0.692	0.691	0.716	-	0.12	0.917
70% median HDI														
Total	0.191	0.197	0.2	0.195	0.202	0.205	0.201	-	0.946	0.961	0.995	-	0.197	0.970
Males	0.183	0.187	0.189	0.186	0.186	0.190	0.189	-	0.984	0.984	1.000	-	0.187	0.979
Females	0.198	0.207	0.212	0.203	0.219	0.220	0.213	-	0.904	0.941	0.995	-	0.207	0.957
60% median HDI														
0-15 years	0.080	0.078	0.075	0.077	-	-	-	-				-	0.093	0.860
16-29 years	0.266	0.277	0.279	0.275	0.356	0.374	0.392	-	0.747	0.741	0.712	-	0.274	0.971
30-44 years	0.086	0.085	0.083	0.084	0.071	0.074	0.072	-	1.211	1.149	1.153	-	0.1	0.860
45-64 years	0.051	0.050	0.051	0.05	0.071	0.072	0.067	-	0.718	0.694	0.761	-	0.046	1.109
65+ years	0.154	0.174	0.169	0.139	0.303	0.307	0.277	-	0.508	0.567	0.610	-	0.181	0.851

Notes: Computed for individuals according to their household disposable income (HDI) equivalised by the “modified OECD” equivalence scale. HDI are calculated as the sum of all income sources of all household members net of income tax and social insurance contributions.

Sources: External statistics are based on Danish registry data for persons aged 16 years or older. External data for 2010 were not yet available at the time of writing.



4.3 Summary of “health warnings”

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

The **land value tax** is recorded as part of the total housing costs and not simulated as there is no information on the land value or the tax payment. The land value tax is recorded as a housing cost to make it comparable to tenants, who (indirectly) pay the land value tax as a part of their rent. Approximately 40 per cent of all potential tax payers paid the property tax in 2007, according to external statistics from Statistics Denmark. The tax rate is on average 0.25% of the land value – with a land value of, on average 300,000 (rough calculation from combination of various statistics), this makes 750DKR per year.

5. REFERENCES

EUROSTAT (2010): EU-SILC 065 (2008-operation) - Description of Target Variables: Cross-sectional and Longitudinal. Version January 2010.

StatBank Denmark: www.statistikbanken.dk.

Verbist, G. (2004) “Redistributive effect and progressivity of taxes An International Comparison across the EU using EUROMOD”, EUROMOD Working Paper No. EM5/04.

- *Sources for tax-benefit descriptions/rules*

The description and the derived modeling of the Danish tax and benefit system builds on various sources, mostly only in Danish:

- The Ministry of Taxation, www.skm.dk/foreign/
- Volumes 2007-2010 of the Handbook on Social Benefits, The Danish Insurance Association
- The citizens’ entry point for information on public benefits etc., www.borger.dk