

EUROMOD

The Tax-Benefit Microsimulation Model for the EU

Holly Sutherland
Francesco Figari
Horacio Levy
Christine Lietz
Daniela Mantovani
Alari Paulus

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Outline

- Background and current status
- Multi-country simulation issues
- Model structure
- Parameter files
- Input datasets
- Further references

Overview

- EUROMOD is a multi-country static tax-benefit microsimulation model for the countries of the EU
- Typical features but unique for its multi-country dimension:
 - designed for comparative analysis of the effects of policies on household income
 - achieved through maximising user choice and model flexibility
 - makes it complex to use as well as extremely powerful
- Consistent results across countries allow:
 - Comparative analysis
 - EU-level outputs
 - Implications of common changes or changes with common objectives
 - Policy learning across countries
 - Understanding the effects of tax-benefit systems on different populations
 - “Borrowing” policies that seem effective in one country (e.g. UK WFTC)

Background

- It was built because of difficulties in making national model calculations comparable
- First constructed by an EU15-wide consortium, funded by a series of EC FP grants (1996-2004)
- National models exist in most of the EU15 and some of the NMS
- Typically much *more* flexible than national models but in some cases covering the tax-benefit systems in *less* detail or more selectively
 - National models for national analysis without complex changes
 - EUROMOD for comparative/comparable multi-country analysis and national analysis involving complex changes

Current status

- Direct taxes and cash benefits only, no indirect taxes or non-cash benefits
- Most contributory benefits and pensions are not fully simulated
- Static calculations only
- Benefit take up is assumed to be 100%, no tax evasion.
- Tax benefit systems for 1998, 2001, 2003 (most)
- EU15 only, 4 NMS being incorporated (EE, PL, HU, SI)

Work in progress

- EUROMOD is continuously being developed and improved
- I-CUE – FP6 RIDS project “Improving the Capacity and Usability of EUROMOD” 2005-08
 - Beginning the process of integrating the NMS in EUROMOD
 - Re-building EUROMOD in the light of experience and of the need to handle 25+ systems and data
- AIM-AP – FP6 project “Accurate income measurement for the assessment of public policies” 2006-09
 - Indirect taxes
 - Non-cash incomes
 - Benefit take-up and tax evasion

Multi-country simulations: data

- What is different across countries?
 - Type of source of micro-data and reference period
 - Some input variables
 - Level of detail
 - Currency
- What is (or can be) common across countries?
 - Main set of input variables
 - Output variables

Multi-country simulations: systems

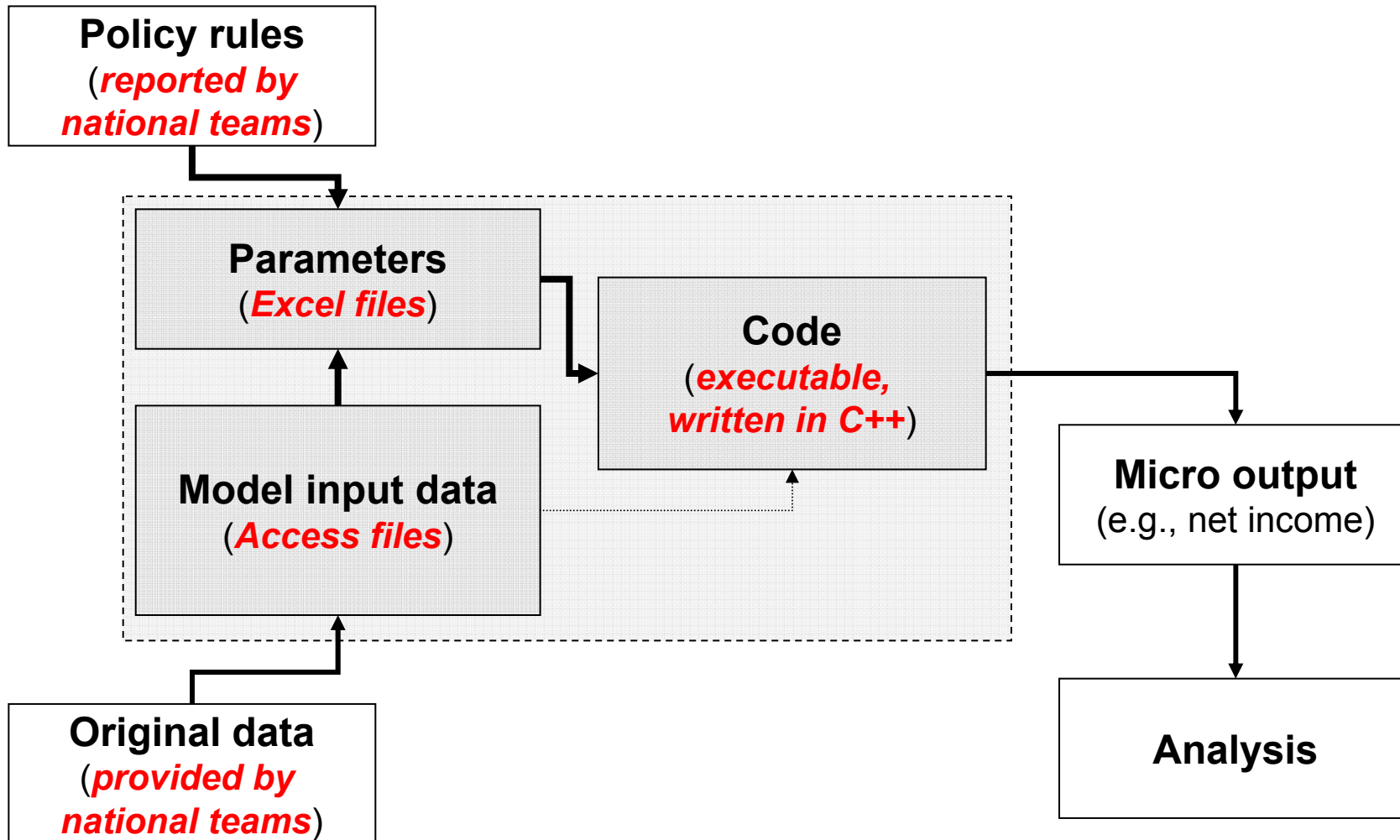
- What is different across countries?
 - Structure of system – which taxes and benefits, order of policy simulations
 - Policy design – structure and components of taxes/benefits
 - Definitions – income and unit of assessment
- What is (or can be) common across countries?
 - Overall model framework and management routines
 - Key tax-benefit calculator modules (eligibility rules, assessment unit definitions)

Level of parameterisation: an example

Parameters for a *child benefit* subject to an income test:

- Typical national model:
 - Benefit amount and income test limit
- EUROMOD in addition:
 - Income concept to be used in the income test
 - Eligibility conditions
 - Unit of assessment
 - Definition of children
 - Interaction with other policies

EUROMOD structure



EUROMOD parameter files

Excel files that contain the information the model needs to produce its output:

- CONTROL files → define datasets and tax-benefit systems
- SPINE files → order of policy simulations
- POLICY files → rules of a particular tax/benefit decomposed into elements (policy modules)
- TAX UNIT files → units of assessment
- INCOME LIST files → income concepts
- VARDESC files → variable declarations

Main menu



List and order of policy

Policy spine files

Microsoft Excel - spine_UK.xls

File Edit View Insert Format Tools Data Window Help

R40 fx

	A	B	C	I	J
1	<u>Wages min UK</u>	1	coempy	cad	Minimum wage introduced in 1999
2	<u>EESIC UK</u>	1	co_gen_eesic	cad	Employee Social Insurance Contribution
3	<u>ERSIC UK</u>	1	co_gen_ersic	cad	Employer Social Insurance Contribution
4	<u>iben ue UK</u>	1	uk_iben_UE	cad	Job Seekers Allowance
5	<u>sben heating UK</u>	1	uk_sben_heating	cad	Pensioner's annual heating allowance
6	<u>IT UK</u>	1	co_nat_inctax	cad	Income Tax
7	<u>sben wtc ctc UK</u>	1	uk_sben_wtc	cad	Working Tax Credit and Child Tax Credit
8	<u>SBEN CB UK</u>	1	uk_sben_CB	cad	Child Benefit
9	<u>SBEN virt IS UK</u>	1	uk_IS_temp	cad	Preliminary IS used for the nondependent deduction
10	<u>sben nondep ded UK</u>	1	uk_sben_nondep_ded	cad	Nondependent deduction
11	<u>SBEN IS UK</u>	1	uk_sben_IS	cad	Actual Income Support
12	<u>sben hb UK</u>	1	co_sben_hb	cad	housing benefits
13	<u>sben ctb ndd UK</u>	1	uk_sben_ctb_nondep_ded	cad	Council Tax Benefit Nondependent deduction
14	<u>sben ctb UK</u>	1	uk_sben_ctb	cad	uk council tax benefits
15	<u>SHARING equal UK</u>	1	uk_sben_CB	cad	Shares variables specified here
16	<u>SHARING proportional UK</u>	1	uk_sben	cad	Shares variables specified here
17	<u>OUTPUT std UK</u>	1	n/a		standard Output of Results
18	<u>OUTPUT EXT std UK</u>	1	n/a		extended Standard Output of Results
19					

Ready

NUM

spine_uk_1998 spine_uk_2001 spine_uk_2003

'master switches'

Policy files

Policy modules (functions)

Microsoft Excel - pol_EE_example

File Edit View Insert Format Tools Data Window Help

16 fx

	A	B	C	D	E	F	G	H
1	am	param_name	period_s		EE_2003	EE_2005	EE_2007	
2		first_module						
3		co_ArithOp						
4		formula	y		12000	20400	24000	
5		output_var			co_tinta	co_tinta	co_tinta	
6		TAX_UNIT			individual ee	individual ee	individual ee	
7		SWITCH			1	1	1	
8		co_ArithOp						
9		formula			amount#1 * nPersl			
10		#1_amount	y		3			
11		uplimit_il			il_Pensions	il_Pensions	il_Pensions	
12		output_var_addto			1	1	1	
13		output_var			co_tinta	co_tinta	co_tinta	
14		TAX_UNIT			ITmarried ee	ITmarried ee	ITmarried ee	
15		SWITCH			1	1	1	
16		co_BenCalc						
17		ncomp			1	1	1	
18		comp1_Cond			{IsNtoMchild}#1	{IsNtoMchild}#1	{IsNtoMchild}#1	
19		#1_N			3	3	2	
20		#1_M			99	99	99	

Ready

polEESIC_EE / polSESIC_EE / polITAgrAlw_EE / polIT_EE / polITwithhold_

Policy years

Policy parameters

Income tax policy

Income list files

Income concepts

List of variables

	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
3	earns																								
4	TaxBase																								
357	cap_TaxBase																								
360	taxable																								
387	peny																								
392	cb_inc																								
394	mi_inc																								
397	Decomp_famben																								
399	Decomp_hb																								
401	Decomp_sab																								
410	Decomp_ub																								
411	OriginalY_incRepY																								
422	Std_dispy																								
424	Originaly																								
425	Out_eesic																								
427	Out_ersic																								
430	Out_tax																								
433	Out_sim tax																								
1208	out_ben																								
1209	out_simben																								
1210	cb_tudef_inc																								
1211	it_tudef_inc																								
1212	socpen_inc																								
1215	end_inc_list																								

'Tax unit' files

Units of assessment

List of parameters

Parameters	tu	co	ind	set					
unit sets	tu	co	ind	set					
names	individual	individual	at	household	at	marrcouple	at	couple	at
	lp	at	SA	individual	at	Mir			
household	0	0	1	0	0	0	0	0	0
individual	1	1	0	0	0	0	0	1	1
spouse	0	0	0	1	1	0	0	0	0
CohabPartner	0	0	0	0	1	0	0	0	0
DepParent	0	0	0	0	0	0	0	0	0
own_child	1	1	1	0	0	1	1	1	1
oth_child	0	0	0	0	0	0	0	0	0
exclude_non_rel	0	0	0	0	0	0	0	0	0
exclude_with_income	0	0	0	0	0	0	0	0	0
exclude_with_income_il	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
exclude_with_income lt	0	0	0	0	0	0	0	0	0
cd_min_age	0	0	0	0	0	0	0	0	0
cd_agelow	15	17	17	0	0	17	17	17	17
cd_agehigh	18	26	26	0	0	26	26	26	26
cd_IfParent	0	1	1	1	1	1	1	1	1
list_cd_cond	0	0	0	0	0	0	0	0	0
cd_InFTed	0	2	2	0	0	1	2	2	2
cd_InFTbed	1	0	0	0	0	0	0	0	0
cd_InFTsed	1	0	0	0	0	0	0	0	0
cd_InFTted	0	0	0	0	0	0	0	0	0
cd_Married	-1	0	0	0	0	0	0	0	0
cd_Cohab	0	0	0	0	0	0	0	0	0
cd_PrntIsLP	0	0	0	0	0	0	0	0	0
cd_Unemp	0	0	0	0	0	0	0	0	0
cd_Military	0	0	0	0	0	0	0	0	0
cd_Disabled	0	1	1	0	0	0	0	1	1
cd_le_Age1	0	0	0	0	0	0	0	0	0
cd_le_Age2	0	0	0	0	0	0	0	0	0
cd_le_Age3	0	0	0	0	0	0	0	0	0

EUROMOD input microdata

Country	Base Dataset	Type
Austria	Austrian version of EU-SILC	National version of EU panel
Belgium	Panel Survey on Belgian Households	National panel
Denmark	European Community Household Panel	Europe-wide panel
Finland	Income distribution survey	Register + survey
France	Budget de Famille	Household budget survey
Germany	German Socio-Economic Panel	National panel
Greece	Household Budget Survey	Household budget survey
Ireland	Living in Ireland Survey	National panel
Italy	Survey of Households Income and Wealth	Income survey
Luxembourg	PSELL-2	National panel
Netherlands	Sociaal-economisch panelonderzoek	National panel
Portugal	European Community Household Panel	Europe-wide panel
Spain	European Community Household Panel	Europe-wide panel
Sweden	Income distribution survey	Register + survey
UK	Family Expenditure Survey	Household budget survey

Further information on EUROMOD

- Technical papers:
 - Immervoll H, C O'Donoghue and H Sutherland (1999), An Introduction to EUROMOD, EM 0/99.
 - Sutherland H (ed) (2001), EUROMOD: an integrated European Benefit-tax model. Final Report, EM 9/01.
 - Lietz C and D Mantovani (2006): Lessons from building and using EUROMOD, EM 5/06.
- Web site: <http://www.iser.essex.ac.uk/msu/emod/>
 - Country Reports
 - Recipes
 - Working Papers

Examples of EUROMOD use

- Feres P, H Immervoll, C Lietz, H Levy, D Mantovani and H Sutherland (2002): *Indicators for Social Inclusion in the European Union: how responsive are they to macro-level changes?* EM 3/02.
- Immervoll H and C O'Donoghue (2003): *Employment Transitions in 13 European Countries. Levels, Distributions and Determining Factors of Net Replacement Rates*, EM 3/03.
- Immervoll H, H Jacobsen Kleven, C Thustrup Kreiner, E Saez (2004): *Welfare Reform in European Countries: A Micro-Simulation Analysis*, EM 1/04.
- O Bargain and K Orsini (2006): *Beans for Breakfast? How Exportable is the British Workfare model?* EM 2/06.
- Dang T, H Immervoll, D Mantovani, K Orsini and H Sutherland (2006): *An Age Perspective on Economic Well-Being and Social Protection in Nine OECD Countries*, EM 3/06.
- Levy H, C Lietz and H Sutherland (2006): *A Basic Income for Europe's Children?* EM 4/06.
- Matsaganis M and M Flevotomou (2007): *The impact of mortgage tax relief in the Netherlands, Sweden, Finland, Italy and Greece*, EM 2/07.

Thank you!

euromod@essex.ac.uk