

# EUROMOD: a multi-country tax-benefit model

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## Modelling framework

- Own tax-benefit modelling “*language*” (i.e. functions) written in C++; compiled and documented
- A total of 17 functions provide building blocks for tax-benefit systems and model operations
- The user can change any parameters that drive the functions and may create new policies using these functions
- Excel provides the front end for users and developers (navigation, editor and tools)
- Input data are transformed to a common structure while retaining necessary national specificity; variable naming rules ensure cross-national equivalence

## Examples of EUROMOD functions

- Determine eligibility for benefit receipt, liability for paying taxes or evaluate other conditions (*func\_Elig*)
  - Apply advanced tax schedules (*func\_SchedCalc*)
  - Calculate formulas involving standard arithmetical operations (*func\_ArithOp*)
  - Calculate conditional formulas, e.g. a benefit with multiple components (*func\_BenCalc*)
  - Define assessment units (*func\_DefTU*)
  - Define advanced income concepts, e.g. taxbase, means test (*func\_DefIL*)
  - Determine the division of incomes within the assessment unit (*func\_Allocate*)
- The EUROMOD functions manual is a key document for users and developers

## What is EUROMOD?

- Tax-benefit model for the countries of the European Union
- Highly structured, flexible and transparent
- Relies on national experts in each country
- 20+ input data sources
- Wide (European) network of users
- More than 12 years of development
- Free for academic and non-commercial use

## Key aspects

- ✓ All country specific (data or policy) features are *parameterised* and accessible to the user
- ✓ *Generic* functions and variable definitions (“building blocks”) are designed to work across countries

## Policy example (Polish family allowance in 2005)

List of parameters      Parameter values for each system      Comments

Function	PL_2005	PL_Reform	Comments
<b>func_ArithOp</b>	on	on	<b>INCOME ASSESSMENT</b>
formula	il_bfamt / nPersInUnit	il_bfamt / nPersInUnit	Income from work + imputed agricultural income + income
output_var	sin01_s	sin01_s	Income per capita
TAX_UNIT	tu_fa_bfa_pl	tu_fa_bfa_pl	tu: married couples or single parents with children
<b>func_BenCalc</b>	on	on	<b>Income limit</b>
nComp	2	2	all families
Comp1_Cond	(!IsHeadofTU)	(!IsHeadofTU)	... base families
Comp1_perElig	504#m	1008#m	... complement if there is any disabled child
Comp2_Cond	(!IsDepChild) & (!IsDisabled)	(!IsDepChild) & (!IsDisabled)	complement if there is any disabled child
Comp2_perTU	79#m	158#m	... complement amount
output_var	sin02_s	sin02_s	Income limit
TAX_UNIT	tu_fa_bfa_pl	tu_fa_bfa_pl	tu: married couples or single parents with children
<b>func_Elig</b>	on	on	<b>ELIGIBILITY: Family must have children and income</b>
elig_cond	(sin01_s < sin02_s)	(sin01_s < sin02_s)	family income below means-test limit
TAX_UNIT	tu_fa_bfa_pl	tu_fa_bfa_pl	tu: married couples or single parents with children
<b>func_BenCalc</b>	on	on	<b>AMOUNT</b>
who_must_be_elig	one	one	amount per child changes according to the number of children
nComp	3	3	first group
Comp1_Cond	(!IsNoChild) #1	(!IsNoChild) #1	... 1st up to
#1_N	1	2	... 2nd child
#1_M	2	2	... amount per child
Comp1_perElig	43#m	43#m	family allowance before lone parent complement
output_var	bch00_s	bch00_s	tu: married couples or single parents with children
TAX_UNIT	tu_fa_bfa_pl	tu_fa_bfa_pl	

Functions

## Example of ‘policy spine’, defining the order of policy simulations (Estonian 2005 system)

Policy systems

Navigation buttons

List of policies

Output variables for each policy

On/off switches for policies

The screenshot shows the 'Policy spine' for the Estonian 2005 system. It lists various policy systems and their status (on/off). The systems listed include: Update\_EE, EDef\_EE, EComp\_EE, DefCovst\_EE, BEN\_UA\_EE, BEN\_CA\_EE, BEN\_CB\_Large\_EE, BEN\_CB\_Schm1\_EE, BEN\_CB\_Arth\_EE, BEN\_CB\_EE, BEN\_CB\_Large\_EE, BEN\_CB\_Schm1\_EE, BEN\_CB\_Arth\_EE, BEN\_CB\_EE, EDef\_EE, EComp\_EE, DefCovst\_EE, BEN\_UA\_EE, BEN\_CA\_EE, BEN\_CB\_Large\_EE, BEN\_CB\_Schm1\_EE, BEN\_CB\_Arth\_EE, BEN\_CB\_EE, EDef\_EE, EComp\_EE, DefCovst\_EE, BEN\_UA\_EE, BEN\_CA\_EE, BEN\_CB\_Large\_EE, BEN\_CB\_Schm1\_EE, BEN\_CB\_Arth\_EE, BEN\_CB\_EE, EDef\_EE, EComp\_EE, DefCovst\_EE, BEN\_UA\_EE, BEN\_CA\_EE, BEN\_CB\_Large\_EE, BEN\_CB\_Schm1\_EE, BEN\_CB\_Arth\_EE, BEN\_CB\_EE, EDef\_EE, EComp\_EE, DefCovst\_EE, BEN\_UA\_EE, BEN\_CA\_EE, BEN\_CB\_Large\_EE, BEN\_CB\_Schm1\_EE, BEN\_CB\_Arth\_EE, BEN\_CB\_EE, EDef\_EE, EComp\_EE, DefCovst\_EE, BEN\_UA\_EE, BEN\_CA\_EE, BEN\_CB\_Large\_EE, BEN\_CB\_Schm1\_EE, BEN\_CB\_Arth\_EE, BEN\_CB\_EE, EDef\_EE, EComp\_EE, DefCovst\_EE, BEN\_UA\_EE, BEN\_CA\_EE, BEN\_CB\_Large\_EE, 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BEN\_UA\_U

## What is it used for?

- Cross-national comparisons involving
  - equivalent outputs with different inputs
  - wide range of user-controlled options
  - variables that improve cross-national comparability e.g. net social benefits, child contingent payments
- The differential effect of “common” reforms
- Policy learning across countries: “policy swapping”
- EU-level analysis
- General framework can be used to shortcut the process of building comparable models for *any* country (e.g. SAMOD for South Africa)

## Find out more

- Working Papers using EUROMOD
- Info about access to EUROMOD
- EUROMOD documentation
- ...and more.

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