EUROMOD: a EU-wide tool for economic analysis

Francesco Figari

University of Insubria and ISER - University of Essex

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Inequality and Collective Welfare Theory

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Background reading

- Sutherland, H. and F. Figari (2013) “EUROMOD: the European Union tax-benefit microsimulation model” International Journal of Microsimulation 6(1) 4-26.

- Figari, F., A. Paulus and H. Sutherland (2013) “Microsimulation and Policy Analysis”, in Handbook of Income Distribution Volume 2, edited by A. B. Atkinson and F. Bourguignon, Elsevier, forthcoming.

- … and papers cited there

Microsimulation

- Microsimulation is a general term for modelling the behaviour and interactions of micro units (persons, households, firms etc)
- Microsimulation model is a set of rules operating on a representative sample of micro units
- Given the available information, microsimulation allows one to build a system that imitates the reality
- Microsimulation models provide customised data for analysis
- Many possible types of issue and micro-unit:
  - traffic flows, water supply...
- Here, focus on income and households (persons)

Tax-benefit models I

- Deal with household income, (re-)calculating income components, i.e. taxes and benefits
- To analyse the effects of tax-benefit reforms on income, welfare and behaviour of individuals
- Several types of model: “static”, “dynamic”, “behavioural”
  - But “static” models can incorporate elements of dynamic modelling and can be linked to behavioural models
- The main aim is to analyse the impact of policy changes on the distribution of target variables, rather than
  - on the mean, as happens using regression techniques
  - on individual cases, as happens using OECD-style standard family type calculations

Tax-benefit models II

- Tax-benefit models deal with income, re-calculating income components (taxes and benefits) for households from micro-datasets under different assumptions
  - Policy change
  - Exogenous economic change (e.g. earnings growth; unemployment)
  - Household characteristics
- Typically: income taxes, social contributions and cash benefits
  - + sometimes indirect taxes, non-cash incomes
- Main indicators/outputs
  - Risk-of-poverty and income inequality
  - Budgetary cost of changes
  - Gainers and losers from policy changes
  - Indicators of work incentives
- “Budget constraints”

Microdata versus family type calculations

- Microsimulation models generally are based on sample surveys, which provide detailed information about individual and family characteristics, labor force status, housing status, earnings.
  - It is also common to analyze tax-benefit effects using a range of representative households (e.g. OECD Model family calculations)
  - Atkinson and Sutherland (1983) found that some 4% of actual families were covered by the hypothetical family model used by the Department of Health and Social Security
  - This concern is even more relevant for some of the theoretical simulation models used to investigate the effects of government policy in a complex intertemporal setting.

Added value to survey/register microdata

- Information which is otherwise not (publicly) available
  - e.g. tax deductions, benefit eligibility, net/gross values
- Indicators which only exist as output from a MSM
  - e.g. METRs, RRs, budget constraint charts, child contingent payments, net social benefits
- More up-to-date results (as data collection and release takes time)
- Results under alternative scenarios/assumptions
  - policy changes (reforms or illustrative changes)
  - changes in personal/household characteristics

EUROMOD – a model

- Multi-country tax-benefit MSM for the EU countries: unique
- It was built because of difficulties in making national model calculations comparable
- National models exist in many of the countries covered
- A tool for comparative multi-country research and policy analysis: consistent results

EUROMOD - Introduction

- Typical features but unique for its multi-country dimension:
  - designed for comparative analysis of the effects of policies on household income
  - harmonised data and simulations
  - achieved through maximising user choice and model flexibility
  - tax-benefit modelling language: universal
  - library of policies

- Consistent results across countries allow:
  - Comparative analysis
  - EU-level outputs
  - Implications of common changes or changes with common objectives
  - Policy learning across countries

What is unique about EUROMOD?

- Many (27+) countries in a common framework
- Open access: “the most used microsimulation model in the world”
- National tax-benefit modelling capacity
- Highly flexible and transparent
  - Comparability
  - Easy to simulate major reforms to policy structures
  - Short cut to model building (non-EU)
- Core EUROMOD: effects of policy changes on income (+ effects of other changes on impact of policy)
  - First round budgetary, distributional and incentive effects
  - Cross country comparisons, EU-level analysis, “policy swaps”
- Up to the model user to (e.g.)
  - Link to labour supply or macro models
  - Extend policy scope (subject to data availability)
- Facilitates user-designed extensions and linkages (“talks” to Stata)

Policies simulated in EUROMOD

- Income taxes
- Employee, self-employed and employer Social Insurance Contributions
- Benefits that depend on current income and observed characteristics
- Plus unemployment benefits, with assumptions
- Remaining benefits (e.g. contributory pensions, disability benefits) taken from input data and updated to policy year where necessary
- (Selected countries): Indirect taxes, non cash incomes (imputed rent, public education, public health and child care services)
- Benefit non take-up and tax evasion are considered in some countries

EUROMOD: ways it can be used (I)

- Describing the effects of tax-benefit policies on income inequality and poverty
  - current policies: detail; timeliness
  - policy changes over time holding other things constant (decomposition: “understanding” as well as “monitoring”)
- Using “what if” functionality to construct additional indicators e.g.
  - child-contingent payments
  - work incentive measures
- Indicators and other outputs as ends in themselves or as inputs into other analysis (e.g. combined with other variables from EU-SILC such as deprivation indicators)

EUROMOD: ways it can be used (II)

- Effects of proposed policy changes
- New policy ideas at national or EU level
  - Implications of common changes (e.g. an EU-wide minimum income? Or an EMU unemployment insurance?) or changes with common objectives (e.g. a target reduction in a poverty indicator)
- Economic changes and the effectiveness of existing policies
- Consistent cross-country comparisons
  - Explicit comparisons
  - Policy swaps
- Scenarios for employment, income growth, household composition and policy reform (Europe 2020)

EUROMOD: work in progress

- Continuously being developed and improved
- EUROMOD*update* (2009-2012, 2012-2014) project:
  - funded by DG-EMPL
  - extend EUROMOD to EU27 + Croatia
  - re-base using (mainly) the EU-SILC (up to SILC 2012)
  - update policies to a very recent policy year (2005-2014)
  - establish a regular (annual) programme of updating (data and policies)
  - relies on a network of national experts in each country + core team of developers (researchers), led by U of Essex

EUROMOD work in progress

As well as regular policy and data updates:

SCOPE

- Indirect taxes
- Child-care policies
- “Nowcasting” and forecasting the income distribution
- Treatment of tax evasion and benefit non take-up
- State-of-the-art model family analysis

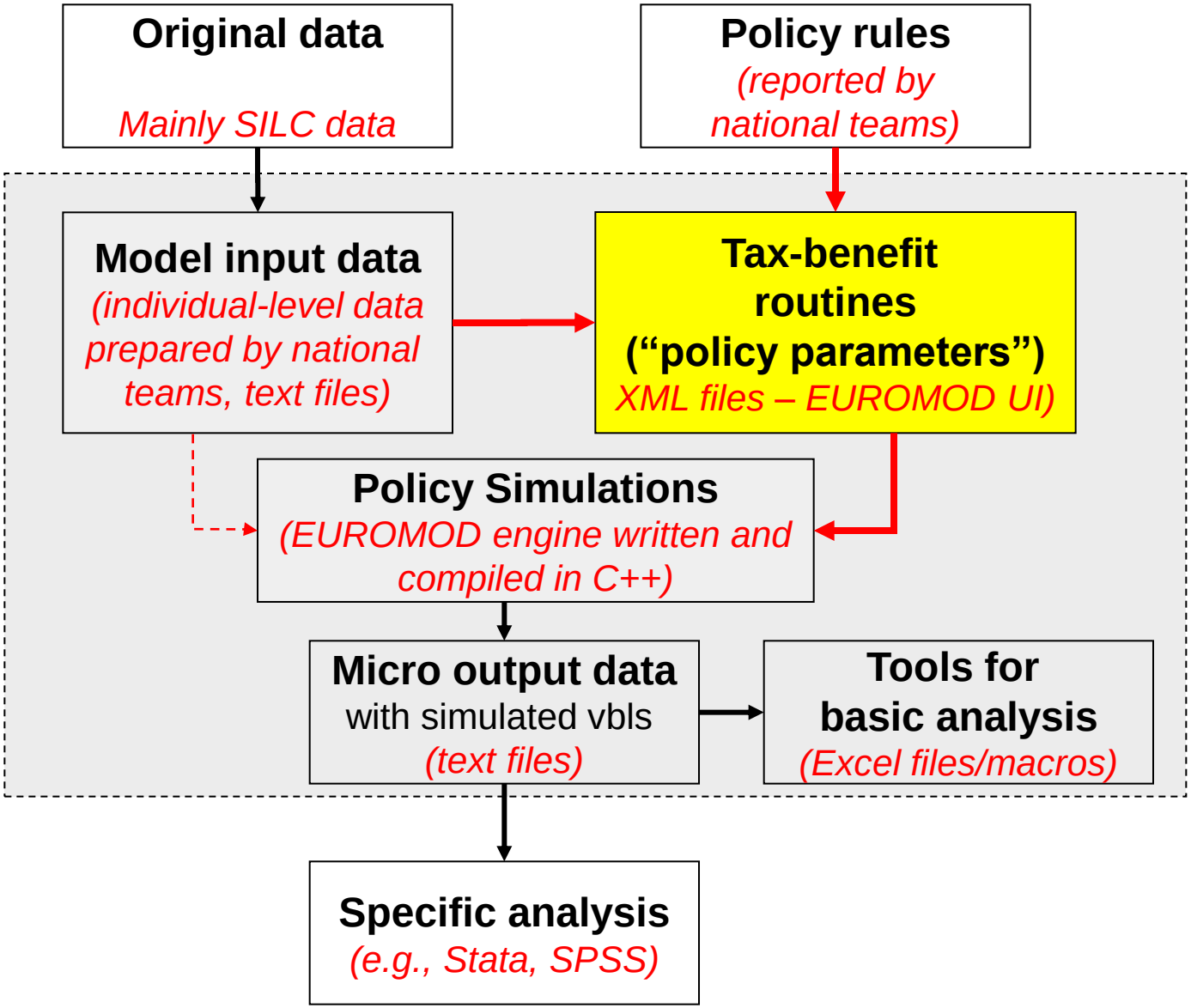
TECHNICAL IMPROVEMENTS

- Further developments to the user interface
- Web-accessible version(s)
- Remote training materials
- Facilitating use as an open platform for model development

EUROMOD – a software platform

- A programming language specific to (static) tax-benefit calculations
- ... yet generic to accommodate different countries
- Again, unique
- Typically much more flexible than national models
  - Flexibility vs complexity
- A framework for building new country models: a short cut
  - Library of tax-benefit routines (i.e. a combination of EM functions)
  - South-Africa, Serbia, Australia (+ Turkey, Russia)

EUROMOD structure



Tax-benefit routines ("parameters")

- Contain all info about tax-benefit rules
- Stored in XML files read by the EUROMOD engine
- Two files per country
  - Data config file
  - Parameters file
- Common Variables file (VarConfig.xml)
- Manipulated via user interface (UI)
- UI-stand alone software based on .NET framework
- Implemented via EUROMOD functions grouped in policies
  - General settings
  - Defining elements to be used later on (tax units, income lists, constants etc.)
  - Simulation of policies
  - Controlling the output file

EUROMOD input database

- Variables: demographic, labour, income, assets, expenditure
- Observations at the individual level
- Harmonised data reference period
- Compulsory variables (e.g., id, age, weight, incomes)
- No missing values
- Gross income
- Monetary variables reported on (average) monthly basis
- Variables naming convention
- Documentation (do-files template and DRD)
- Currently-based on SILC

Access to model and data

- Web http://www.iser.essex.ac.uk/euromod
  - Summary statistics
  - Documentation: Country Reports, Working Papers ….
- Model is freely available for non-commercial use
  - Contact euromod@essex.ac.uk to obtain the link for downloading (incl. manuals)
- Data access conditions are set by the original data provider
  - EU-SILC (UDB): EUROMOD users need to have Eurostat permission to use EU-SILC for this purpose
  - Other data for some countries: relatively straightforward procedures
- Free training courses

EUROMOD

Review of previous research and potential uses

EUROMOD: some key features

- Primary tool for policy analysis
  - A series of recent studies related to the consequences of the crisis and their use in official EU publications
- Increasingly recognised in the academic literature
  - Recent papers appeared in top economic and social policy journals; well embedded in the income distribution literature
- Suitable for many extensions related to the content and the methodology of analysis
  - Coverage (current and potential policy scope)
  - Flexibility (input micro data, language)
  - Interactions with Stata and other statistical softwares
- Interactions and synergies among the above items

Research methodology & areas

A selection, non comprehensive!

a) Counterfactual scenarios

- Recent applications related to the "crisis" (Automatic Stabilisers, AMs, Stress Test)
- “What if"-type studies (policy swapping))

b) Behavioural reactions

- Mainly labour supply reactions
- Different type of links to macro models

c) Tax-benefit design and micro-level indicators

- Pros & cons of specific tax-benefit design issues: tax expenditures (mortgage interest tax relief); tax base (housing taxation); tax schedule (progressivity), …
- Importance of appropriate and timely micro-level indicators (e.g. child contingent support, METRs, nowcasting ...)

d) Interactions of tax-benefit instruments

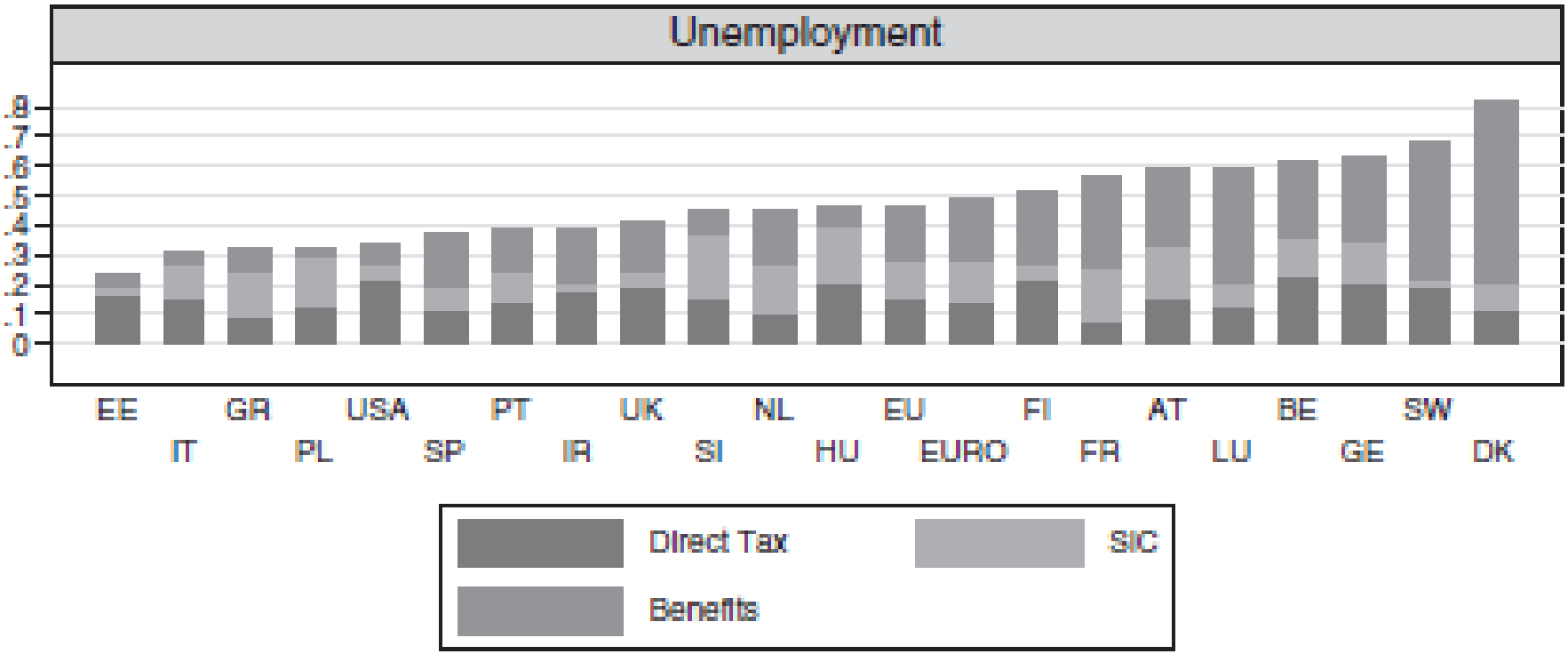
- Indirect taxes, in-kind benefits, ...

Counterfactual scenarios

- MSM approach → a “controlled experiment”
- Definition of an appropriate baseline and a counterfactual scenario
  - i.e. the state *after* policy changes (i.e. how the world would look after implementing new policies) in forward-looking analysis
  - i.e. the state *before* policy changes (i.e. how the world would have looked without new policies or what would happen if policy changes where rolled back) in the case of backward-looking analysis.
- Such counterfactuals are needed
  - for the “morning-after” evaluation of tax-benefit reforms
  - for behavioural models
  - for optimal tax analysis

Counterfactual scenarios - I

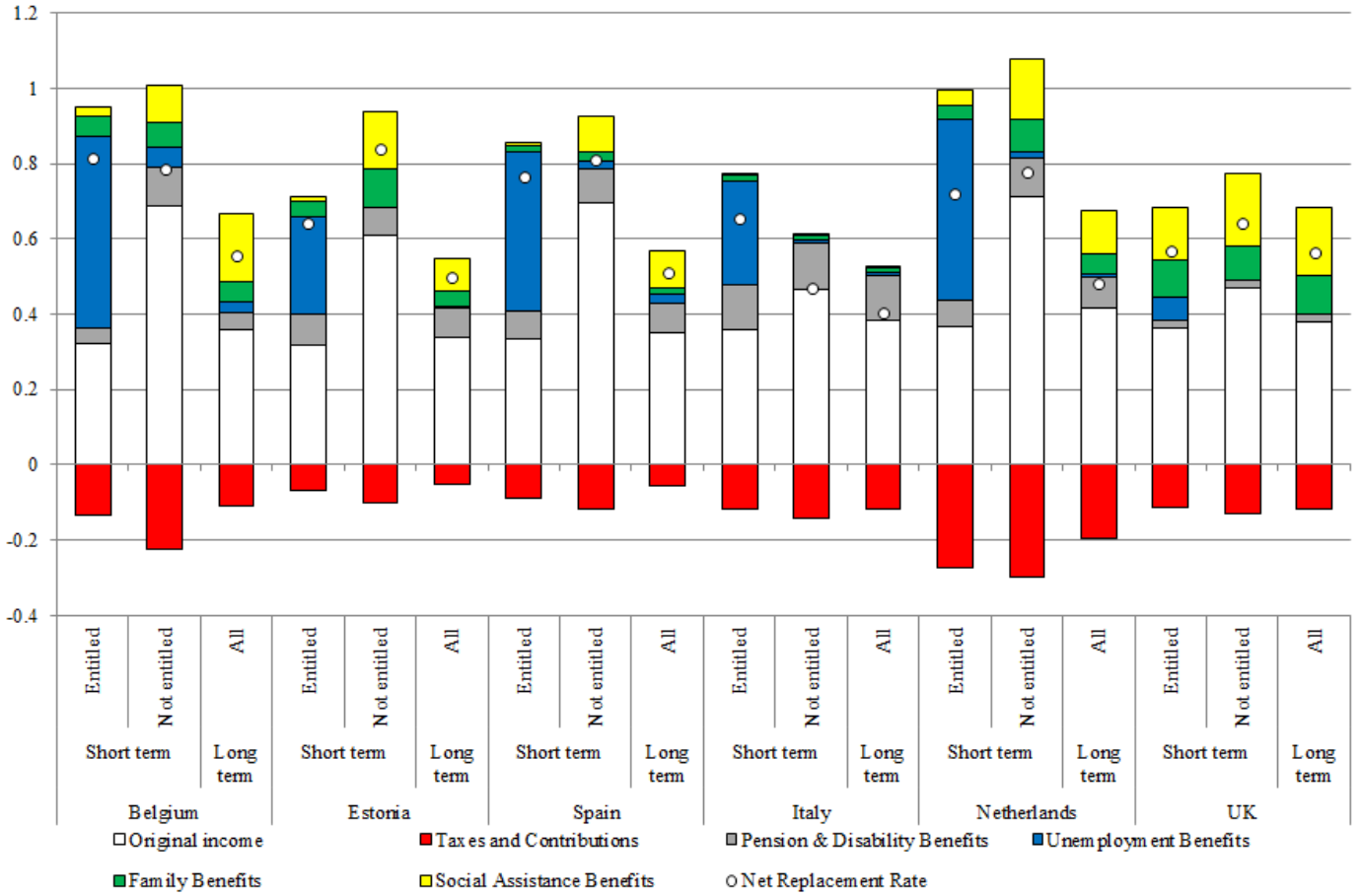
- To what extent income or output fluctuations are moderated by automatic stabilizers ?
  - income (- 5%) or unemployment shocks (such that the total household income decreases by 5%).
  - Stabilization coefficient



Source: Dolls et al. (2012) using EUROMOD and TAXSIM

Counterfactual scenarios - II

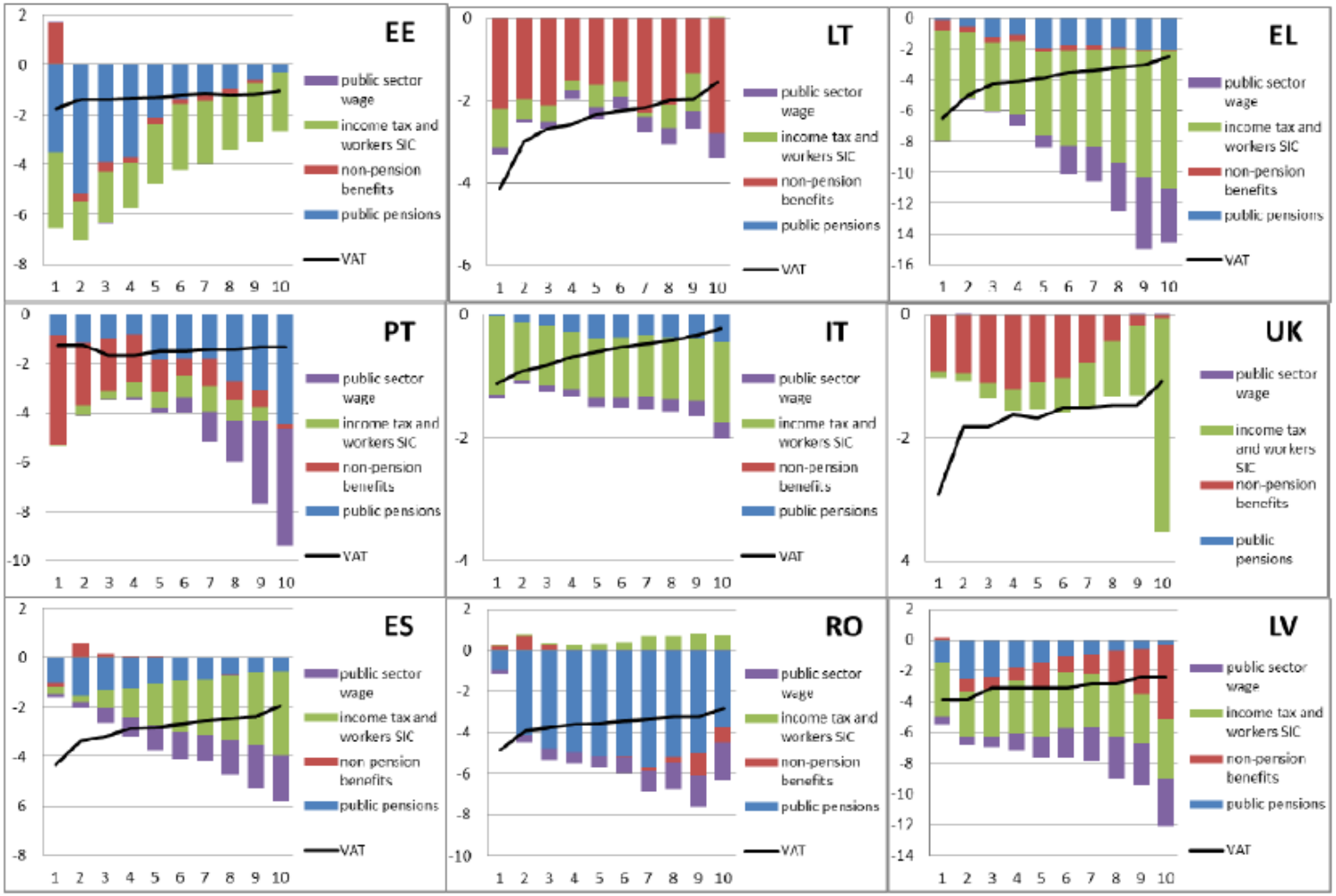
- To what extent tax-benefit systems support those who became unemployed at the onset of the Great Recession ?
  - Simulation of individual transitions



Source: Fernandez et al. (2013) using EUROMOD

Counterfactual scenarios - III

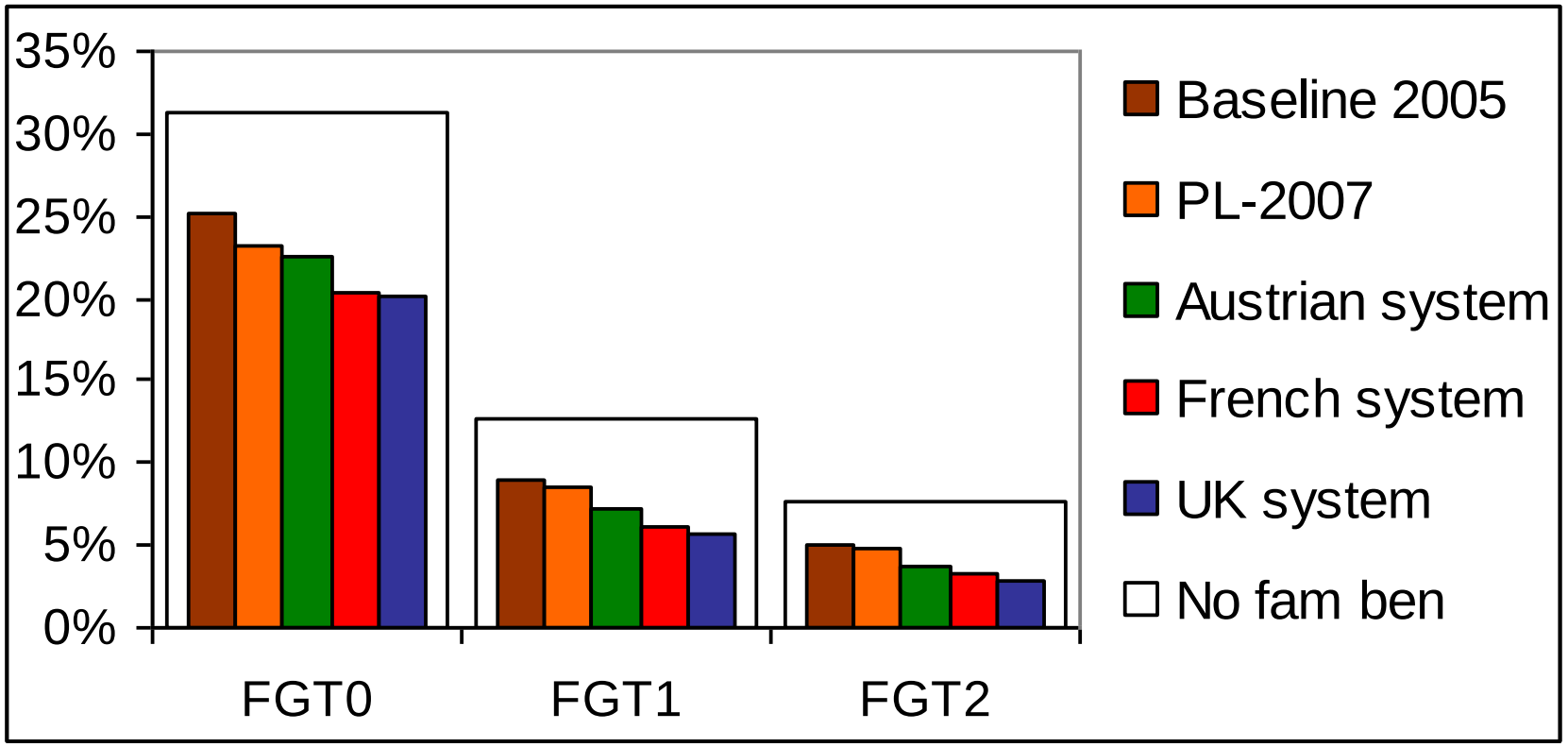
- Which is the distributional impact of the Austerity Measures?
  - Comparison with a business-as-usual scenario transitions



Source: Avram et al. (2013) using EUROMOD

Counterfactual scenarios - IV

- Which are the effects of alternative strategies to support children in Poland ?
  - Policy (system) swapping
  - Revenue neutrality

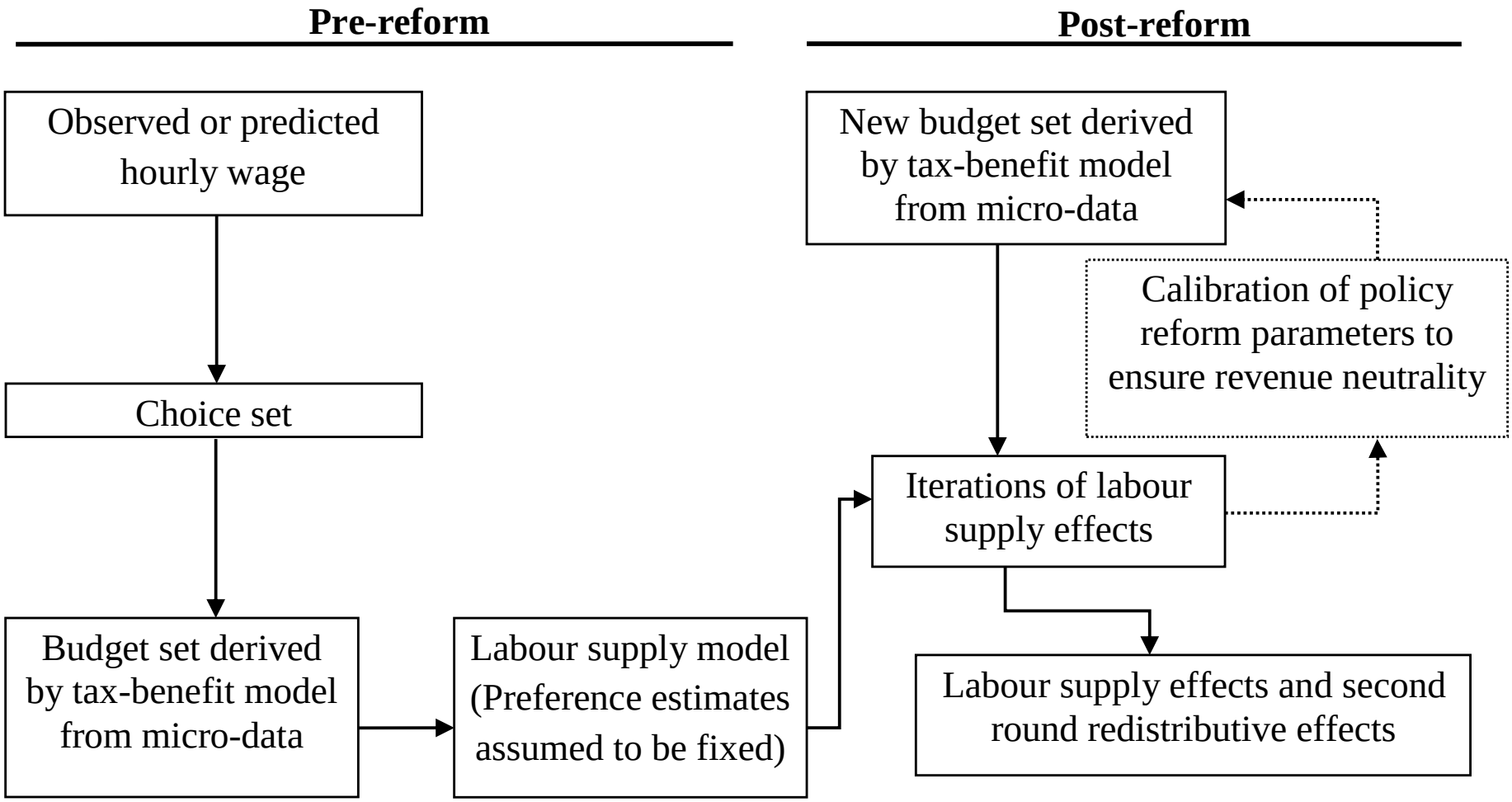


Source: Levy et al. (2009) using EUROMOD

Behavioural reactions

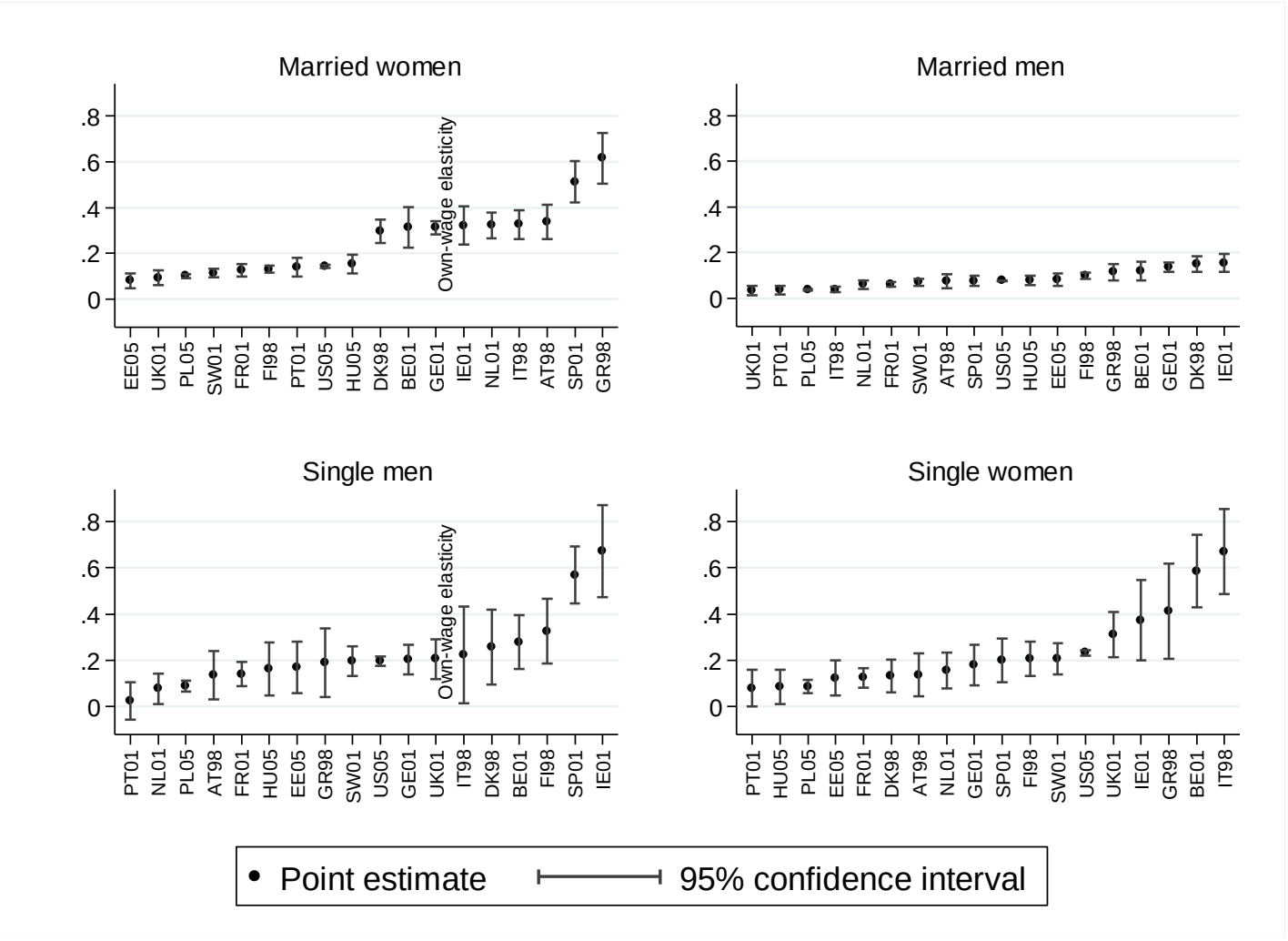
- Impact of policies and macro shocks on individual behaviour
- Micro level: behavioural models
  - Ex-ante evaluation of behavioural reactions to changes in tax-benefit policies
  - Structural discrete choice models
- Macro level: link between MSM and macro models
  - Micro-macro feedbacks (equity and efficiency aspects)
  - Top-down, Bottom-up, Recursive approach

Behavioural reactions – Labour supply model



Behavioural reactions I

- Labour supply elasticities



Source: Bargain et al. (2013) using EUROMOD and TAXSIM

Behavioural reactions II

- Which would be the effects of new in-work benefits in Italy?
  - Transition matrix – women in couples

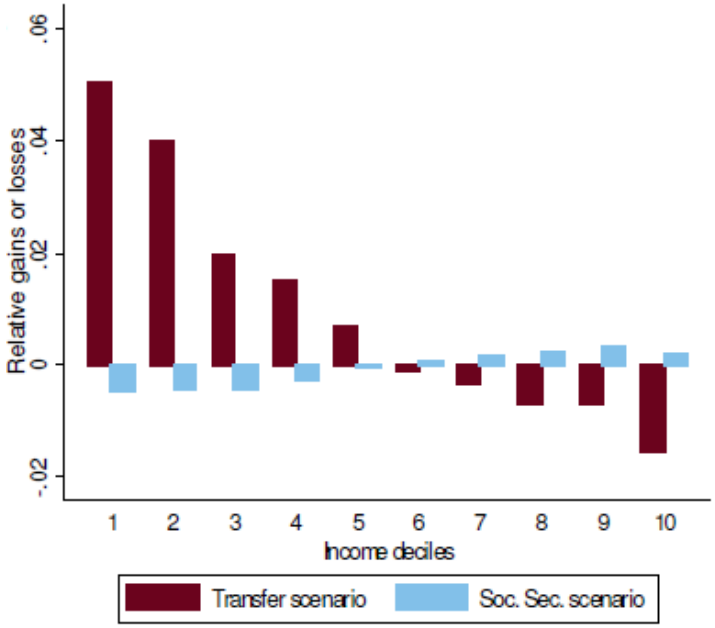
Family based in-work benefit						Individual in-work benefit					
All women in couples											
	Post reform						Post reform				
Pre reform	0-7 hr	8-19 hr	20-30 hr	31-40 hr	41+ hr	Pre reform	0-7 hr	8-19 hr	20-30 hr	31-40 hr	41+ hr
0-7 hr	**39.7**	1.9	0.9	0.3	0.0	0-7 hr	**37.9**	2.9	1.7	0.3	0.0
8-19 hr	0.2	**5.2**	0.0	0.0	0.0	8-19 hr	0.0	**5.3**	0.2	0.0	0.0
20-30 hr	0.2	0.1	**18.7**	0.0	0.0	20-30 hr	0.0	0.3	**18.7**	0.0	0.0
31-40 hr	0.1	0.1	0.0	**26.3**	0.0	31-40 hr	0.0	0.4	0.3	**25.8**	0.0
41+ hr	0.0	0.0	0.0	0.0	**6.2**	41+ hr	0.0	0.0	0.0	0.0	**6.2**

Source: Figari (2011) using EUROMOD

Behavioural reactions III

- Efficiency and Equity Aspects of Energy Taxation
  - GEM-E3 + EUROMOD

Difference (%) with reference (2050)	*Transfer scenario*			
	Brussels	*Flanders*	*Wallonia*	*Belgium*
GDP	-0.14	-0.31	-0.85	-0.40
Employment	1.93	-0.29	-1.99	-0.31
Household cons.	0.34	0.22	0.20	0.22
Investment	0.11	-0.18	-0.78	-0.26
CO2 Emissions	-1.13	-2.55	-3.58	-2.63



Source: Vandyck (2013) using GEM-E3 and EUROMOD

Tax-benefit design and micro-level indicators

- Institutional details of tax-benefit instruments
  - Tax expenditures
  - Tax base
  - ….
- Interactions between different instruments
  - Social Assistance and Income Tax
  - ….
- Appropriate and timely indicators
  - Child contingent support
  - Effective Marginal Tax Rates
  - Nowcasting inequality and poverty rates

Tax-benefit design I

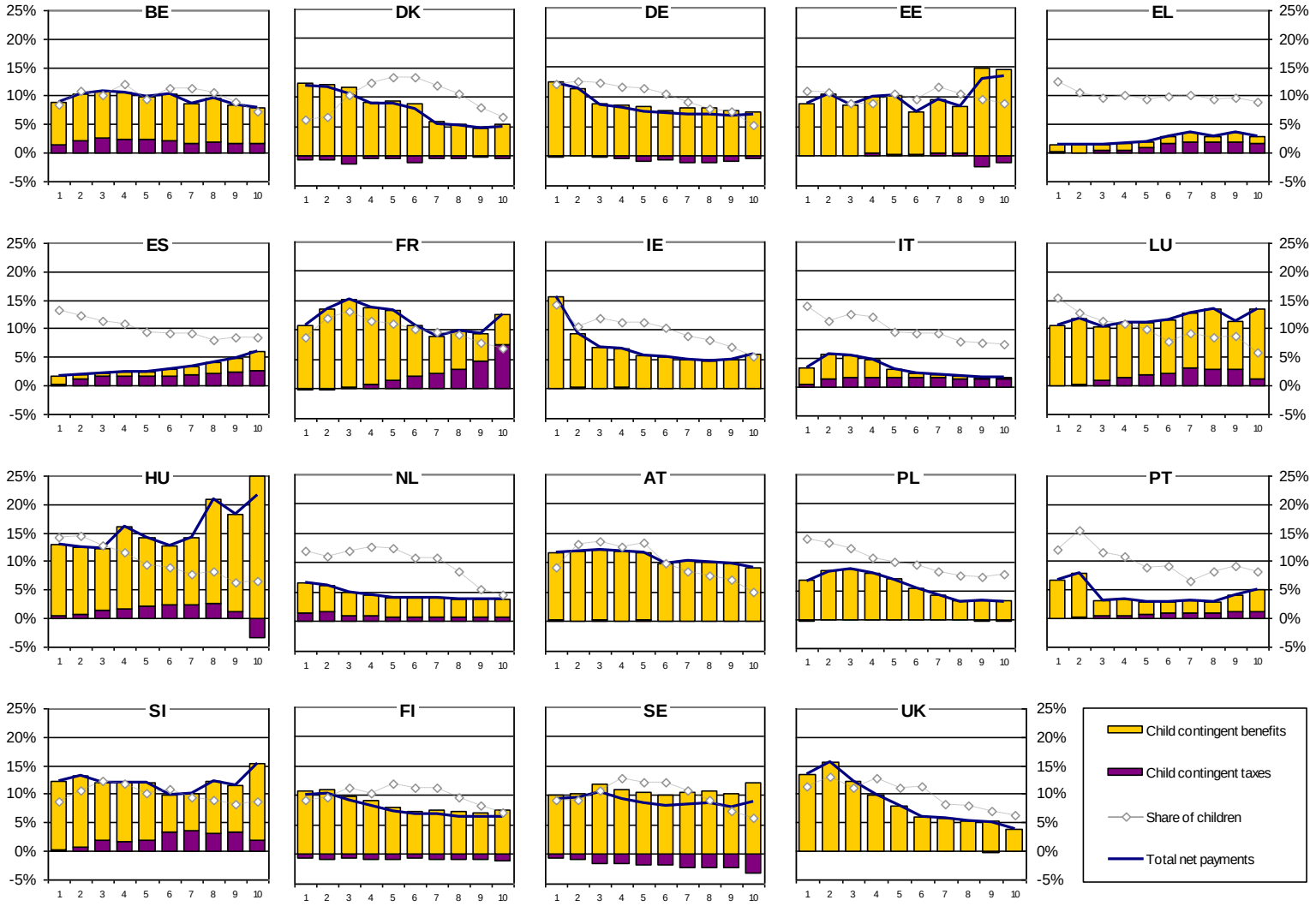
- Distribution of expenditure on mortgage interest tax relief

	Quintile 1 (poorest)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (richest)	All
Denmark	4.1	9.4	17.0	24.8	44.6	100
Finland	3.8	11.3	20.0	28.6	36.3	100
Greece	0.0	2.5	11.9	28.5	57.1	100
Ireland	1.2	9.2	18.2	26.7	44.6	100
Italy	0.6	3.9	21.5	30.9	43.0	100
Luxembourg	1.6	4.0	12.5	39.8	42.2	100
Netherlands	3.6	10.8	17.2	25.9	42.5	100
Portugal	0.2	4.8	17.2	29.7	48.1	100
Spain	1.4	11.8	20.6	28.5	37.8	100
Sweden	5.5	12.8	20.3	28.1	33.3	100

Source: Matsaganis (2011) using EUROMOD

Micro level indicators I

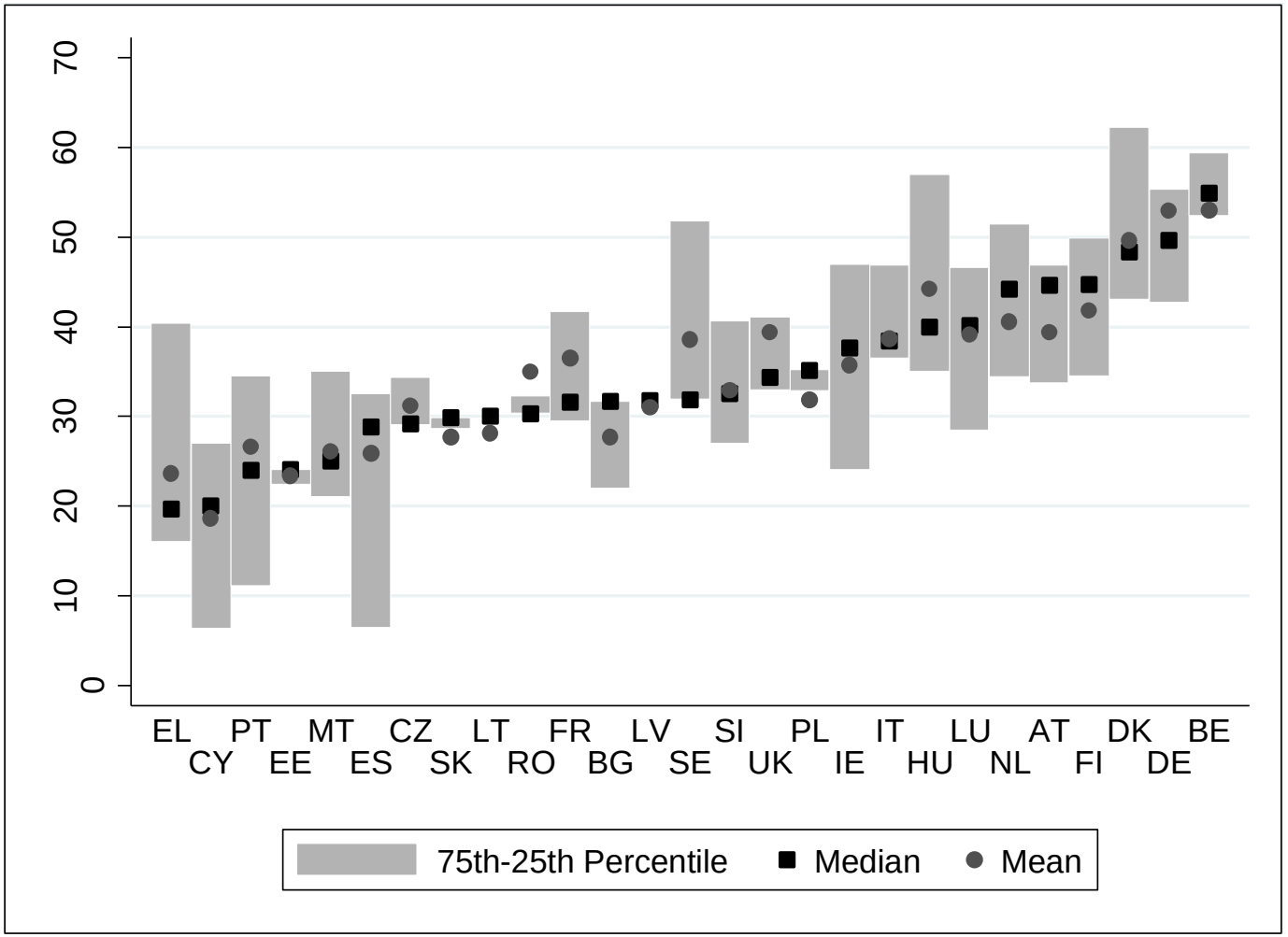
- Child contingent support



Source: Figari, Paulus and Sutherland (2011) using EUROMOD

Micro level indicators II

- Effective Marginal Tax Rates



Source: Jara and Tumino (2013) using EUROMOD

Micro level indicators III

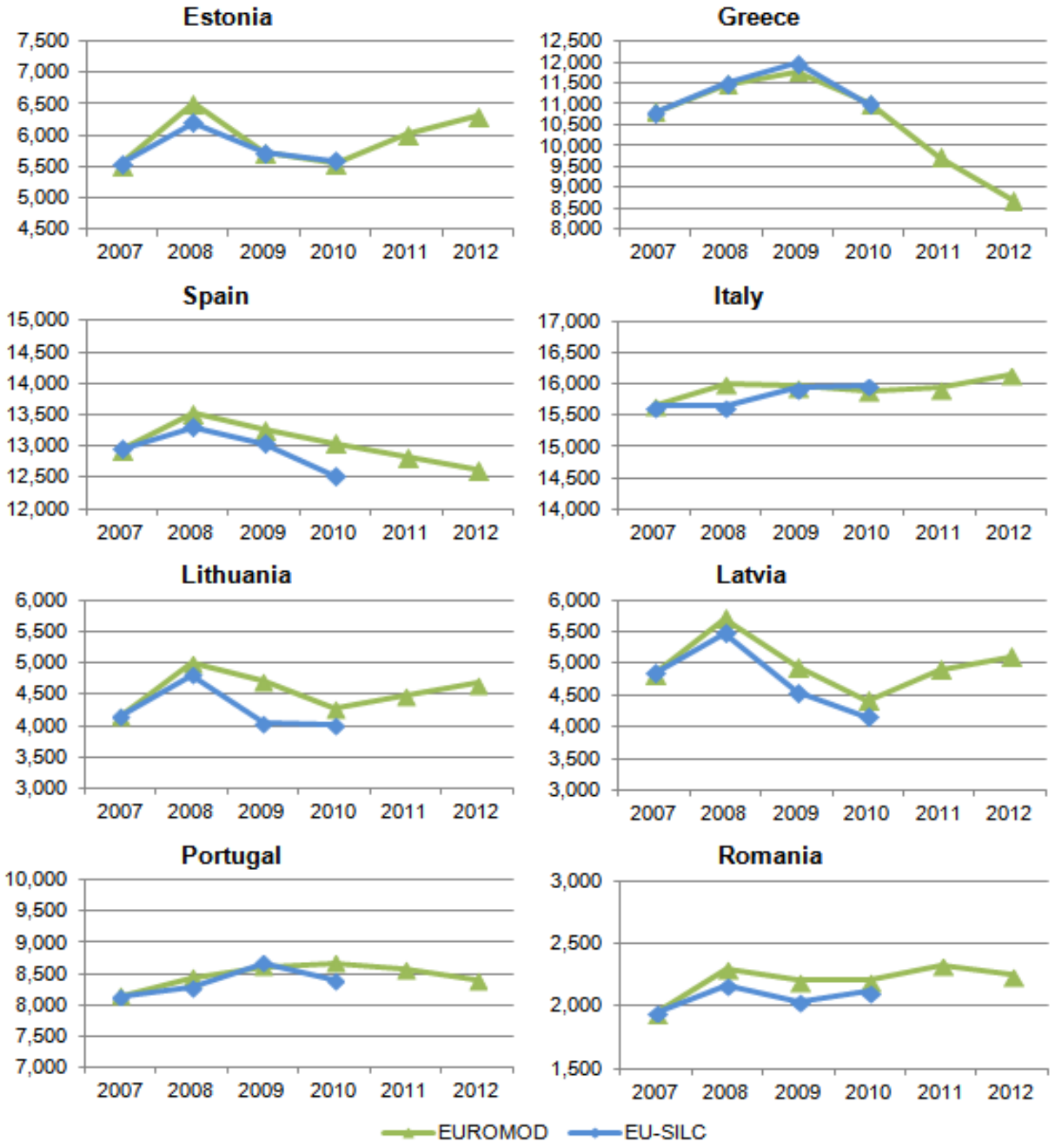
- Nowcasting income and poverty rates
  - EUROMOD simulation
  - Adjusting EUROMOD to account for employment changes
    - **Employment transitions**
      (net changes in employment rates modelled within 18 stratum by age, gender, educational status: random selection + 200 replications for more robust results)
    - Share of **long-term unemployment** to capture changes in eligibility for benefit receipt *(similar method)*
  - Calibration to align EUROMOD and EU-SILC

Nowcasting

EUROMOD 2007-2012 and EU-SILC 2007-2010:
Median equivalized household disposable income (EUR per year)

Note: SILC data corresponds to the income reference period.

Source: Navicke, Rastrigina and Sutherland (2013) using EUROMOD



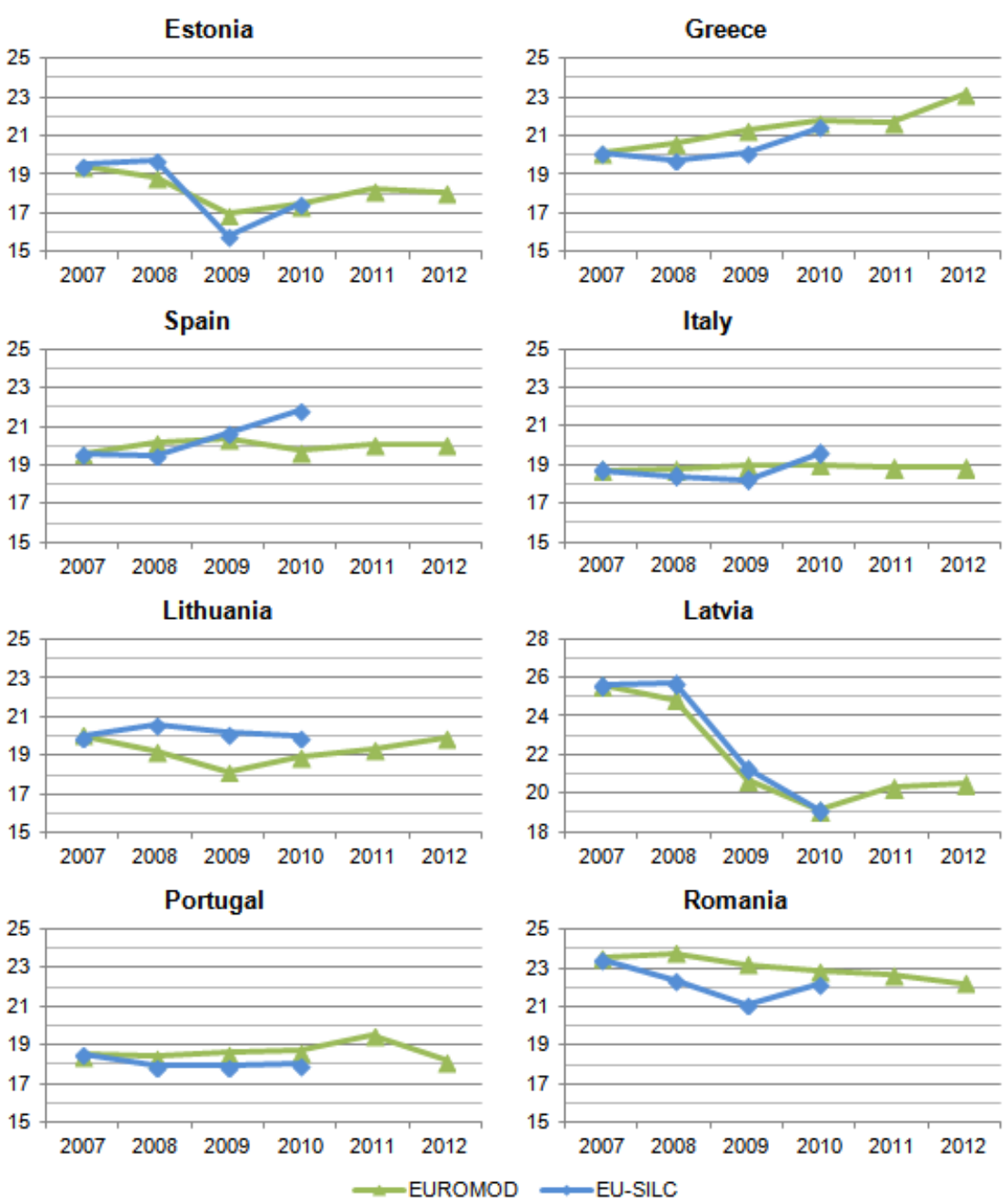
Nowcasting

Poverty risk

EUROMOD 2007-2012 and EU-SILC 2007-2010: At risk of poverty rates (using 60% median as the threshold)

Notes: EU-SILC numbers are lagged by one year to correspond to the income reference year

Source: Navicke, Rastrigina and Sutherland (2013) using EUROMOD

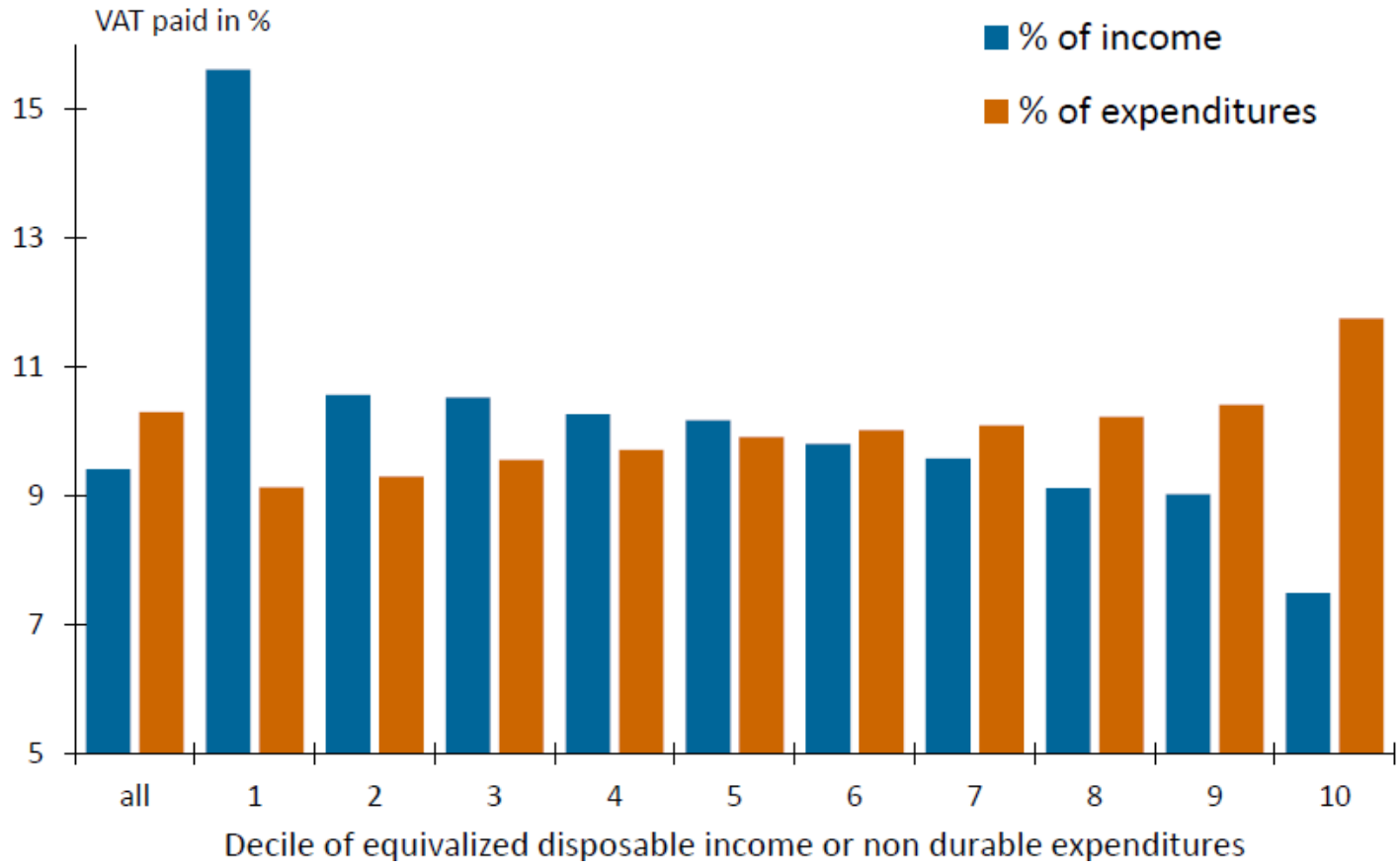


Interactions of tax-benefit instruments

- Whole tax-benefit system
  - Indirect taxes
  - In-kind benefits
- Measurement of individual well-being goes beyond current disposable income
  - Expenditure
  - [Permanent income → dynamic MSM]

Interactions of tax-benefit instruments - I

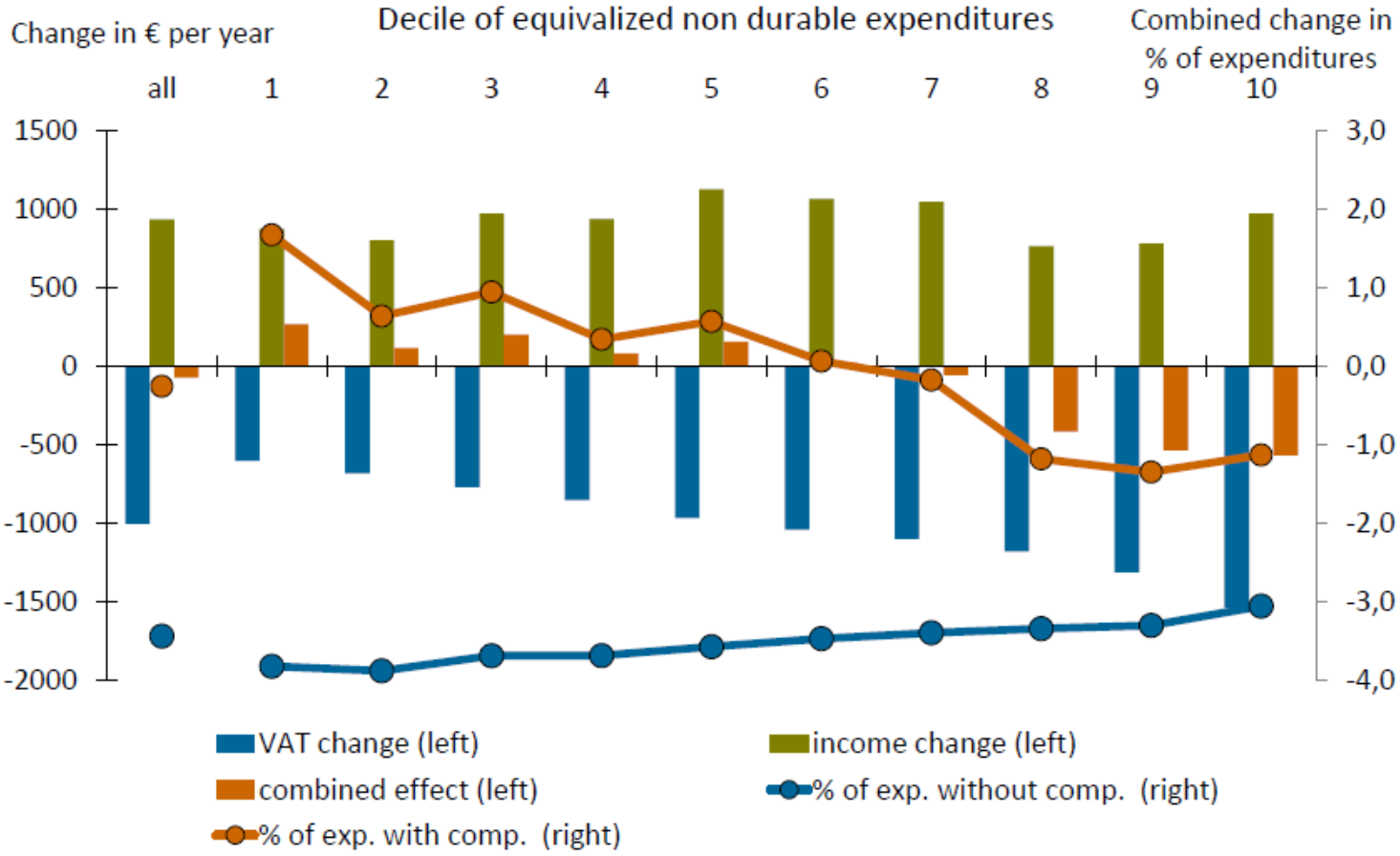
- Does the regressivity of indirect taxes depends on the income concept used in the analysis?
  - Belgium



Source: Decoster et al. (2012) using EUROMOD

Interactions of tax-benefit instruments - II

- Effect of fiscal devaluation (Belgium)
  - Uniform VAT, with increase in social benefits (+2.9%) and decrease in SSC for low wages



Source: Decoster et al. (2012) using EUROMOD

Interactions of tax-benefit instruments - III

- Redistributive effects of tax-benefit components
  - Imputed rent, non cash public education & health transfers
  - Needs-adjusted equivalence scale

	Belgium		Greece		United Kingdom	
Income component	CI	NA	CI	NA	CI	NA
Original income						
Public pensions	29.8	23.0	68.8	43.2	21.1	14.0
Nonmeans-tested benefits	26.0	20.8	24.5	15.4	19.8	13.5
Means-tested benefits	3.3	2.5	0.5	0.3	36.9	24.9
SIC (employer)	12.4	9.8	−0.5	0.0	5.8	4.0
SIC (employee, self-employed)	5.7	4.4	−0.8	−0.5	3.4	2.4
Personal taxes	25.4	19.3	29.9	18.7	20.3	13.9
Disposable income						
Indirect taxes	−2.4	−1.8	−22.4	−13.9	−7.3	−4.7
Post-indirect-tax cash income						
Imputed rent		0.7		10.1		7.5
Noncash public education transfers		9.7		11.0		11.3
Noncash public health transfers		11.4		14.3		12.9
Extended income						

Source: Figari and Paulus (2013) using EUROMOD

Some recent papers using EUROMOD - I

- Avram S., F. Figari, C. Leventi, H. Levy, J. Navicke, M. Matsaganis, E. Militaru, A. Paulus, O. Rastrigina and H. Sutherland, The distributional effects of fiscal consolidation in 9 EU countries, EUROMOD Working Paper EM 2/13, 2013
- Bargain O., The Distributional Effects of Tax-Benefit Policies under New Labour: A Shapley Decomposition, *Oxford Bulletin of Economics and Statistics*, 2012
- Bargain O., Orsini, K., and A. Peichl, 'Comparing Labor Supply Elasticities in Europe and the US: New Results, *Journal of Human Resources*, 2013. Forthcoming
- Decoster A., Spiritus, K, Haan P. and R. Ochmann, Assessing VAT reforms by means of EUROMOD, Presentation at the DG-EMPL Conference Microsimulation for Policy Making in Times Crisis, 2012
- Dolls M., C. Fuest, A. Peichl, Automatic stabilizers and economic crisis: US vs. Europe*, Journal of Public Economics*, 2012.
- Fernandez Salgado M., Figari F., Sutherland H., and A. Tumino, Welfare compensation for unemployment in the Great Recession, *Review of Income and Wealth*, 2013. Forthcoming.

Some recent papers using EUROMOD - II

- Figari F., From housewives to independent earners: can the tax system help Italian women to work?, ISER Working Paper 15-2011, 2011
- Figari F., H. Immervoll, H. Levy, H. Sutherland, Inequalities within couples in Europe: market incomes and the role of taxes and benefits, *Eastern Economic Journal*, 2011
- Figari, F. and A. Paulus, The distributional effects of taxes and transfers under alternative income concepts: the importance of three 'i's, *Public Finance Review, 2013. Forthcoming*.
- Figari F., A. Paulus, H. Sutherland, Measuring the size and impact of public cash support for children in cross-national perspective, *Social Science Computer Review*, 2011.
- Immervoll H., H. J. Kleven, C. T. Kreiner, N. Verdelin, Optimal tax and transfer programs for couples with extensive labor supply responses, *Journal of Public Economics*, 2011.
- Jara X. and A. Tumino, Tax-benefit systems, income distribution and work incentives in the European Union', *The International Journal of Microsimulation* 6(1): 27-62, 2013.

Some recent papers using EUROMOD - III

- Levy H., Morawski, L., and M. Myck, Alternative tax-benefit strategies to support children in Poland, in Lelkes O. and H. Sutherland (Eds.) An Enlarged Role for Tax Benefit Models: assessing policies in the enlarged European Union, Farnham: Asghate, 2009
- Matsaganis M., Estimating the distributional effects of mortgage interest tax relief in Europe, Athens University of Economics and Business, DIEES WP 1109, 2011.
- Navicke, J., O. Rastrigina and H. Sutherland, Nowcasting Indicators of Poverty Risk in the European Union: A Microsimulation Approach, *Social Indicators Research*, 2013. Forthcoming
- Vandyck T., Efficiency and Equity Aspects of Energy Taxation, EUROMOD Working Paper EM 12/13, 2013

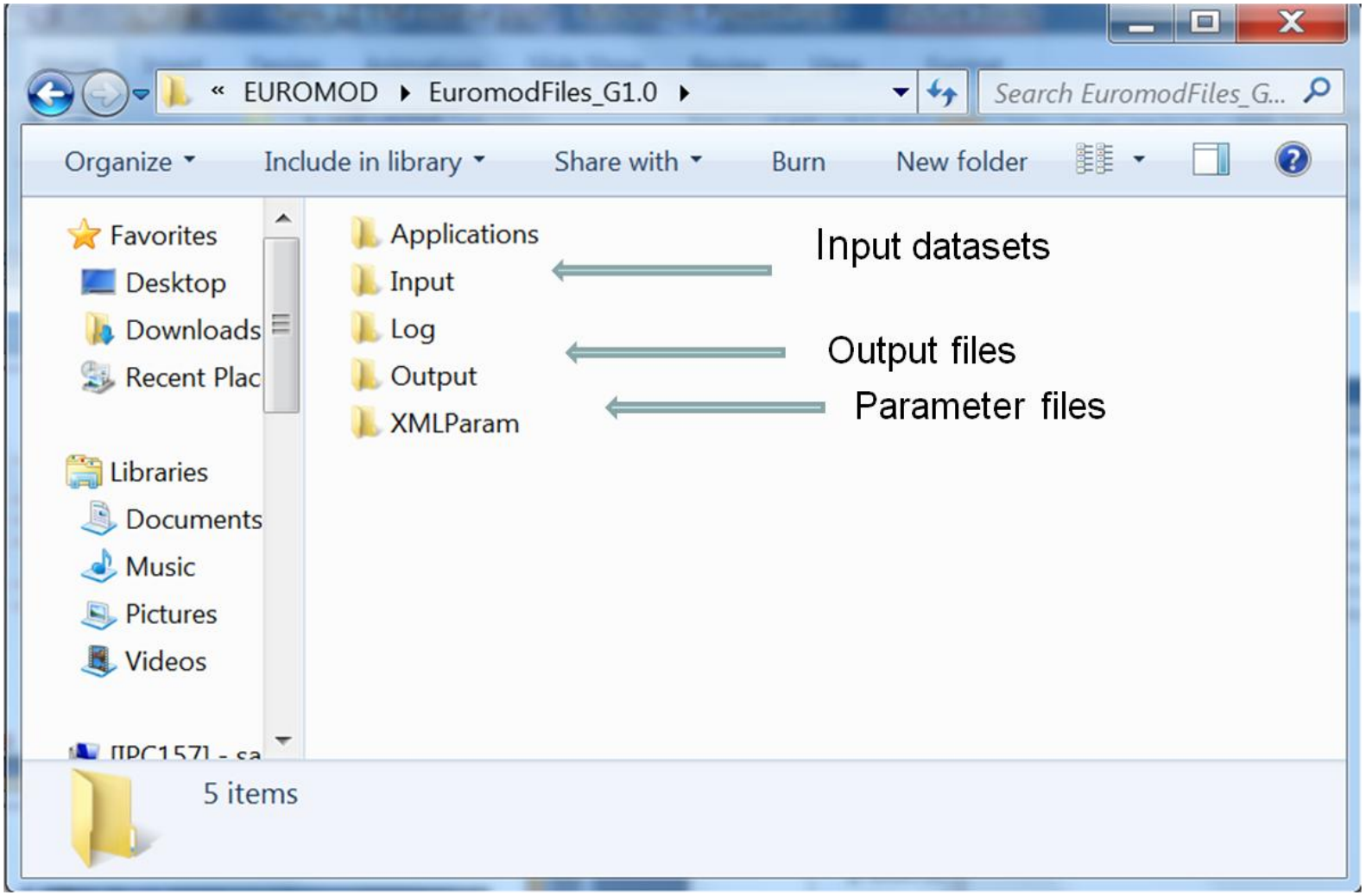
EUROMOD
User Interface

Installation

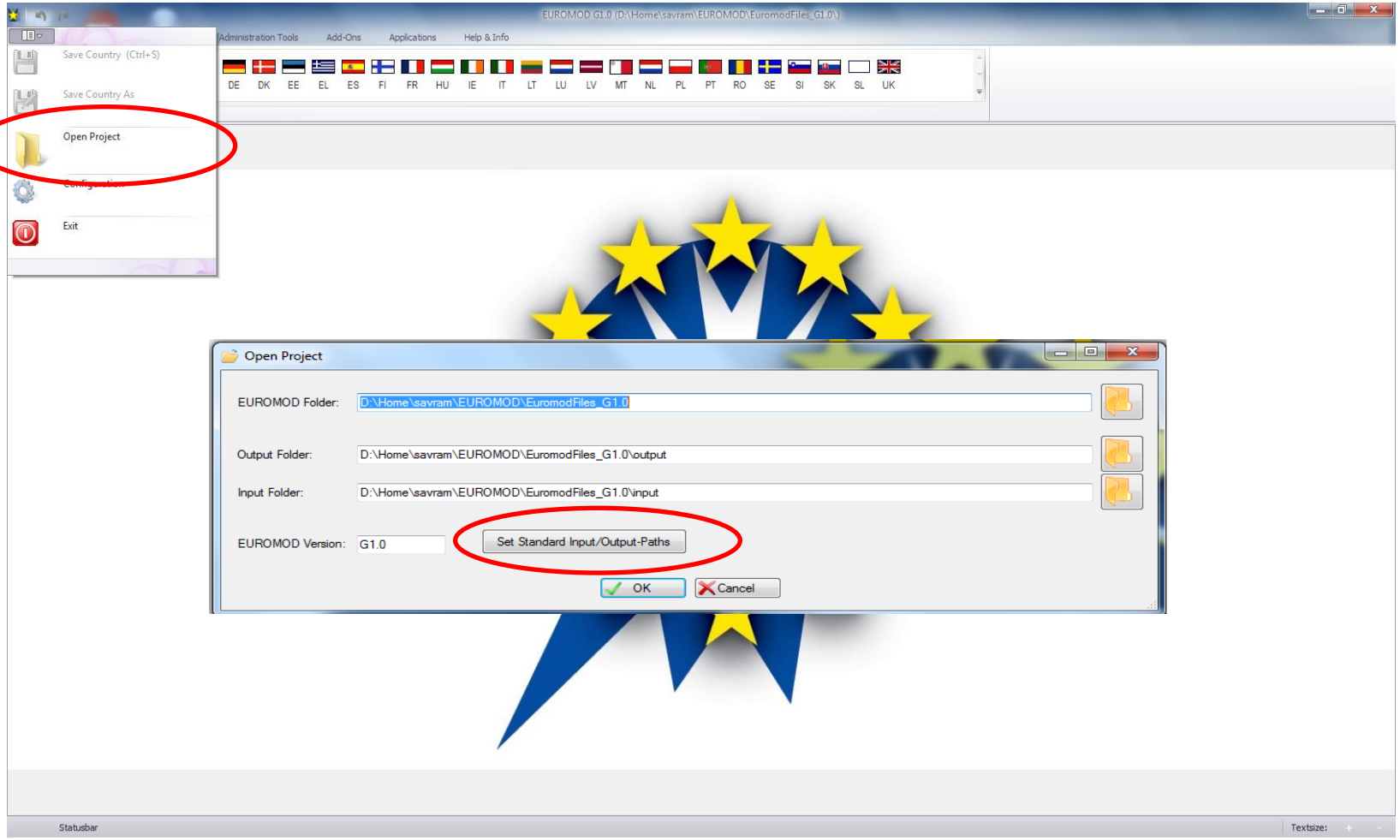
- Requires Microsoft .NET framework files or an Internet connection to download files in the SETUP process
- Complete separation between UI and ‘content’ (i.e. XML) files
- Only one copy of the UI but can use multiple ‘content’ files
- ...but content files must have set structure of folders

- Run the Installation Wizard
- Set the path to your EUROMOD files
- Project path
- (if necessary) separate input data and output data paths

EUROMOD folder structure



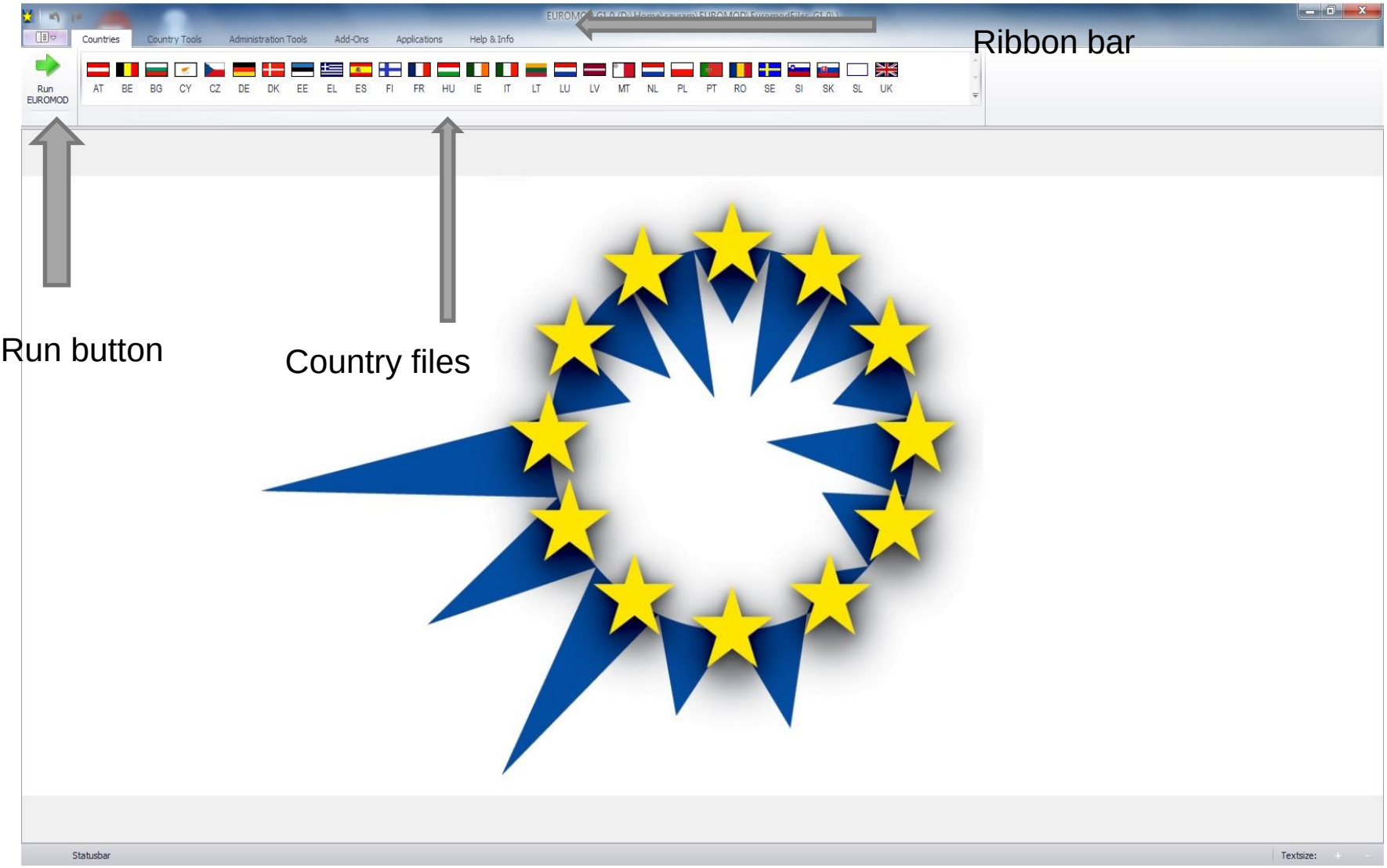
Linking EUROMOD to content files



User Interface (UI)

- Single stand-alone piece of software-Windows OS
- Single working environment
- Mostly point and click but some hot keys are available (standard and specific)
- In-built features that allow for improved user control and guidance
- Intuitive!!
- Features:
  - Ribbon bar with tabs
  - Context menus
  - IntelliSense (suggestion of parameter values)
  - Drag and drop
  - Bookmarks and comments
  - Built-in help

User Interface (UI)



Ribbon bar

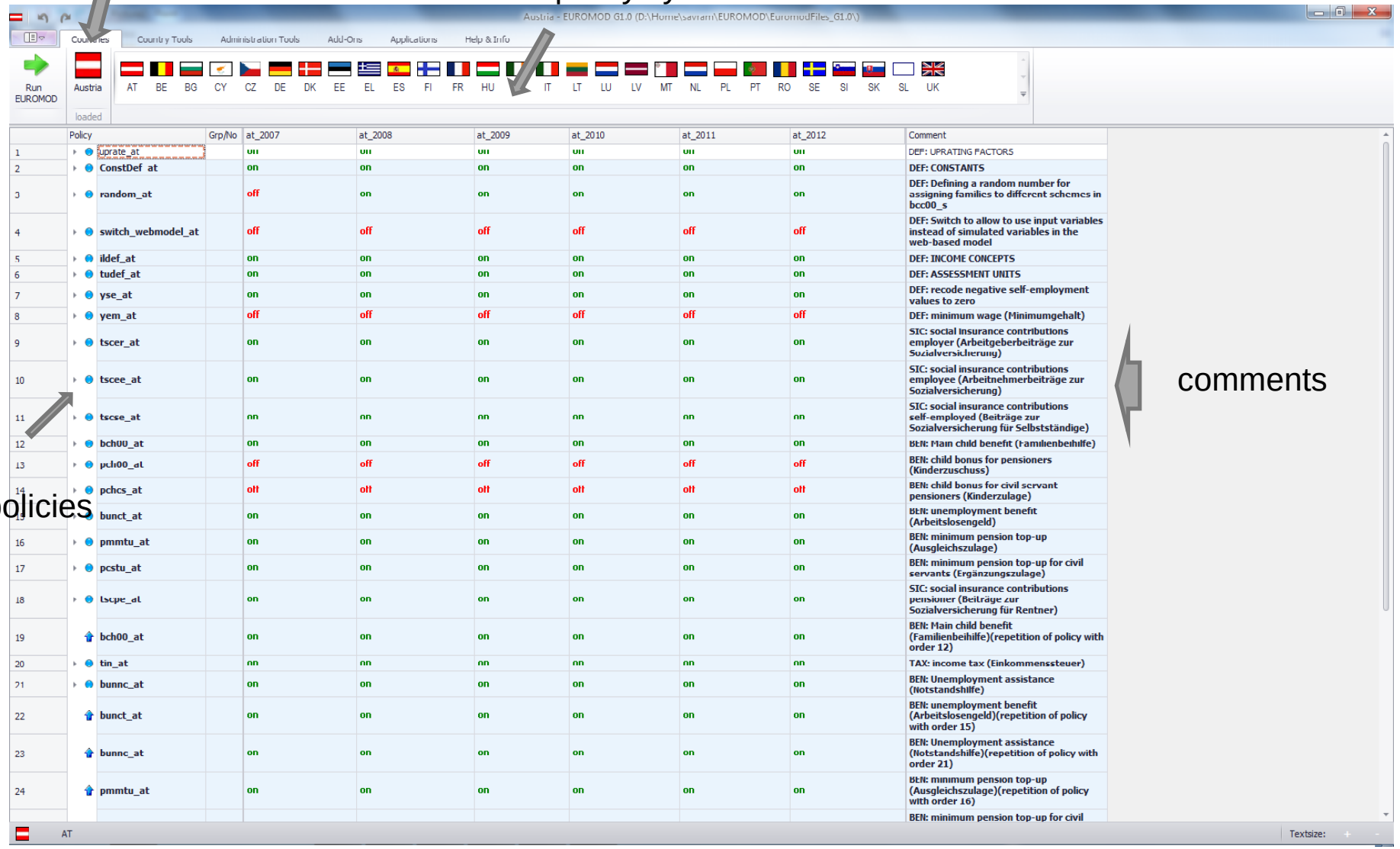
Run button

Country files

Working environment

open country

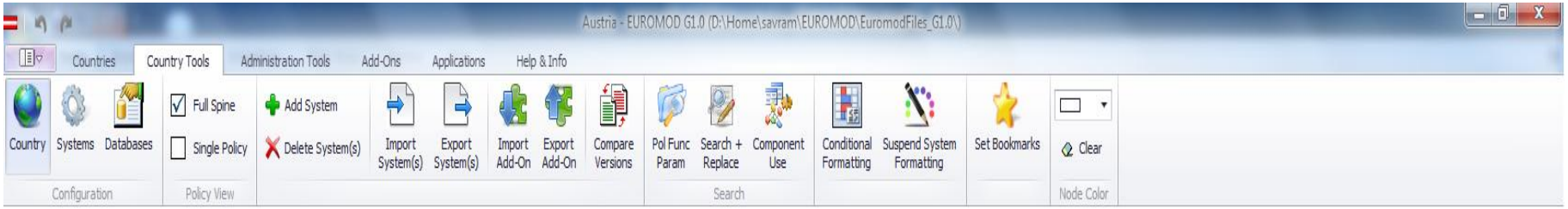
policy systems



comments

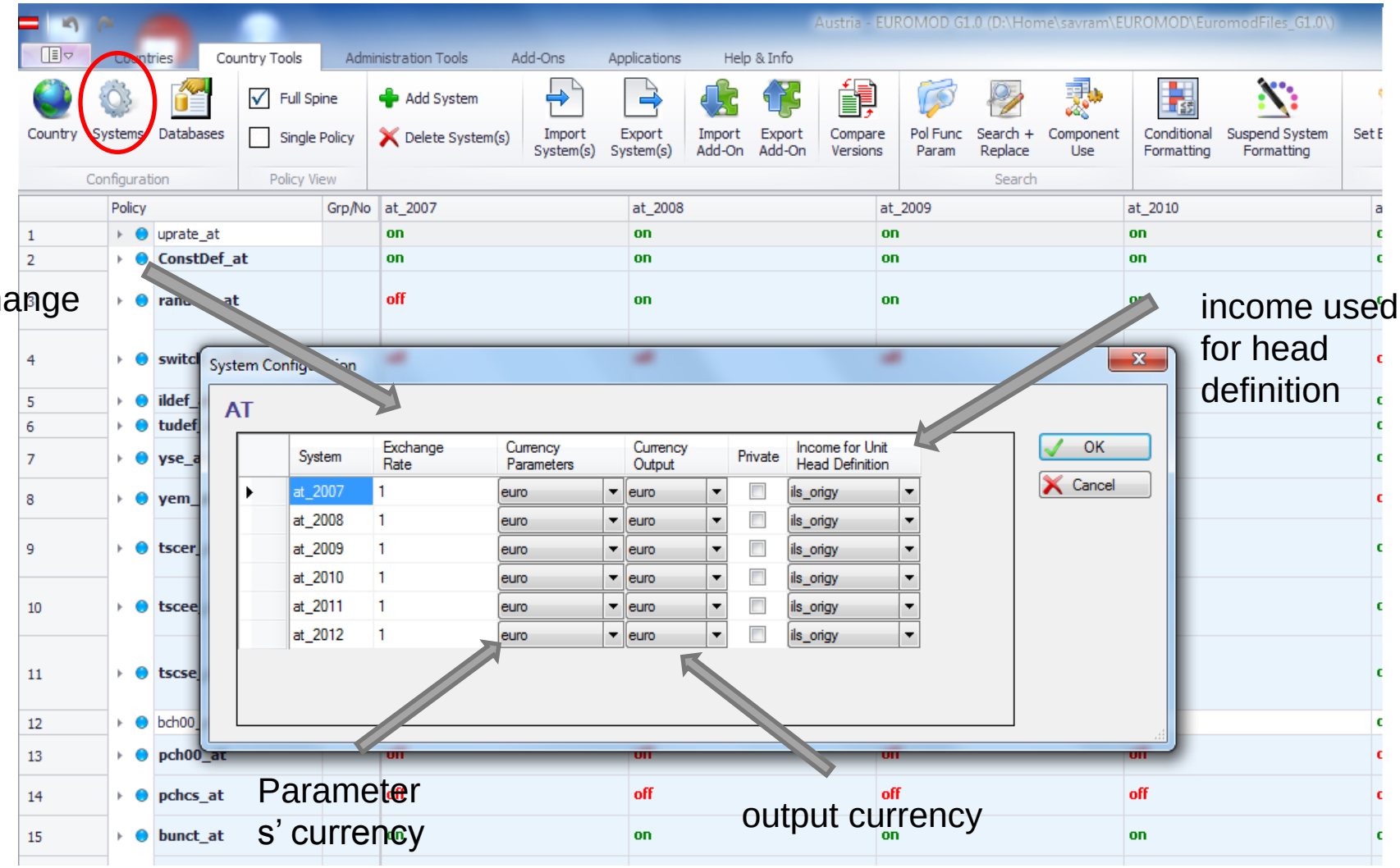
policies

Ribbon bar

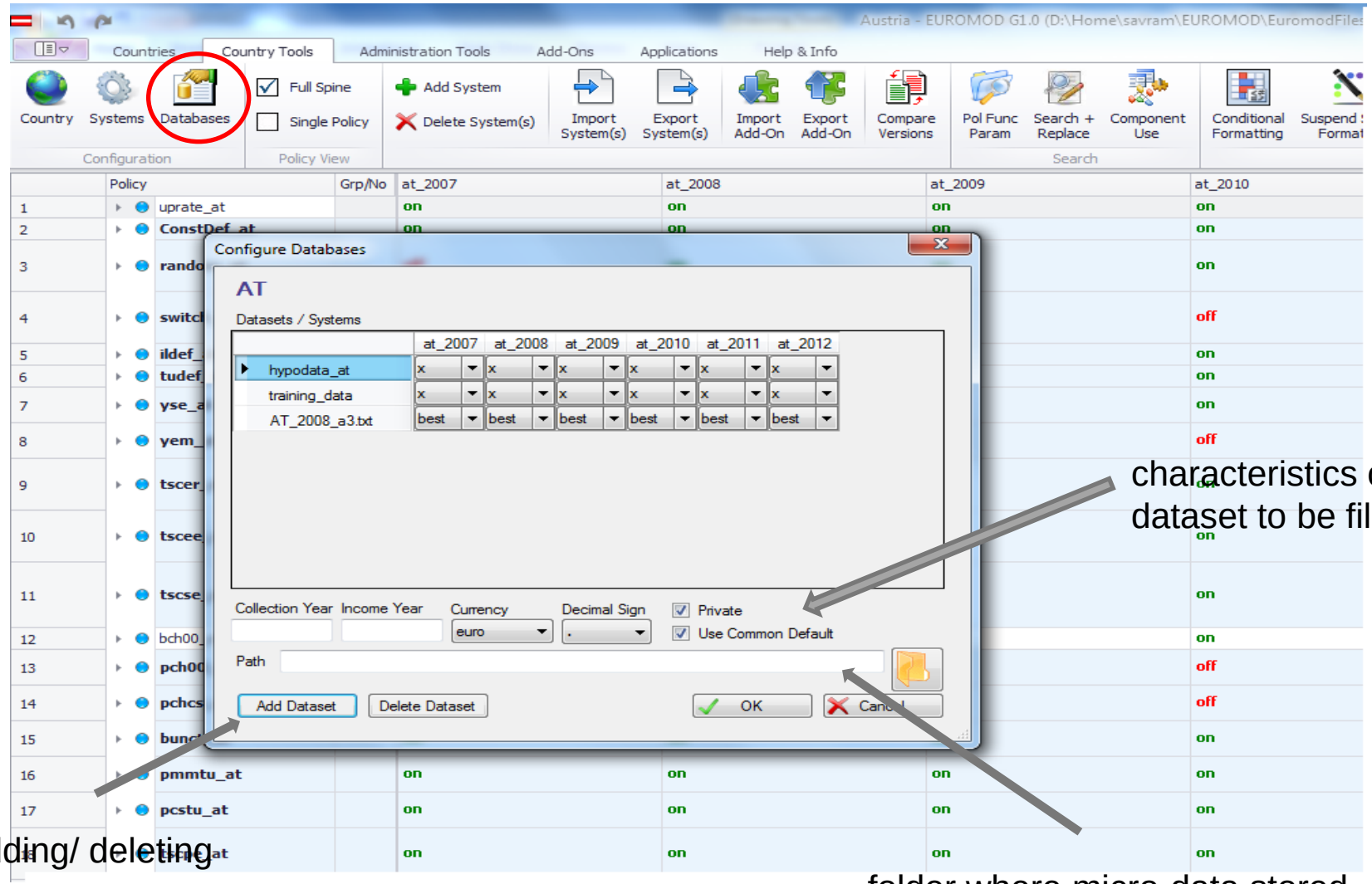


- Country tools:
  - country must be open to activate buttons
  - contains options that manipulate the general parameters of a country file
    -name and acronym
    -currencies used for parameters in the system and output
    -which datasets are available and their characteristics
- Adding and deleting systems
- Viewing options:
  - full spine vs. single policy
  - Search & replace, formatting, bookmarks
- More advanced (import/ export systems, add-ons etc.)

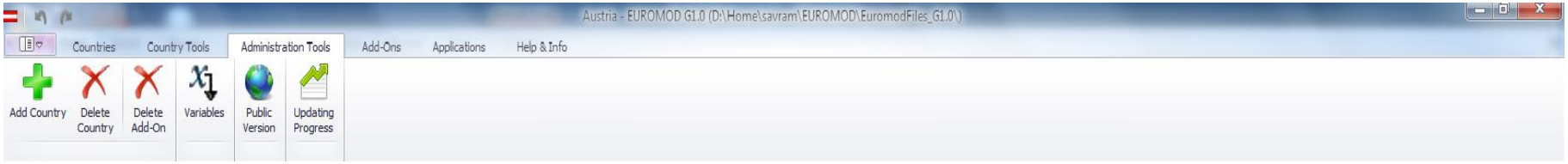
Systems Settings



Database settings



Ribbon bar

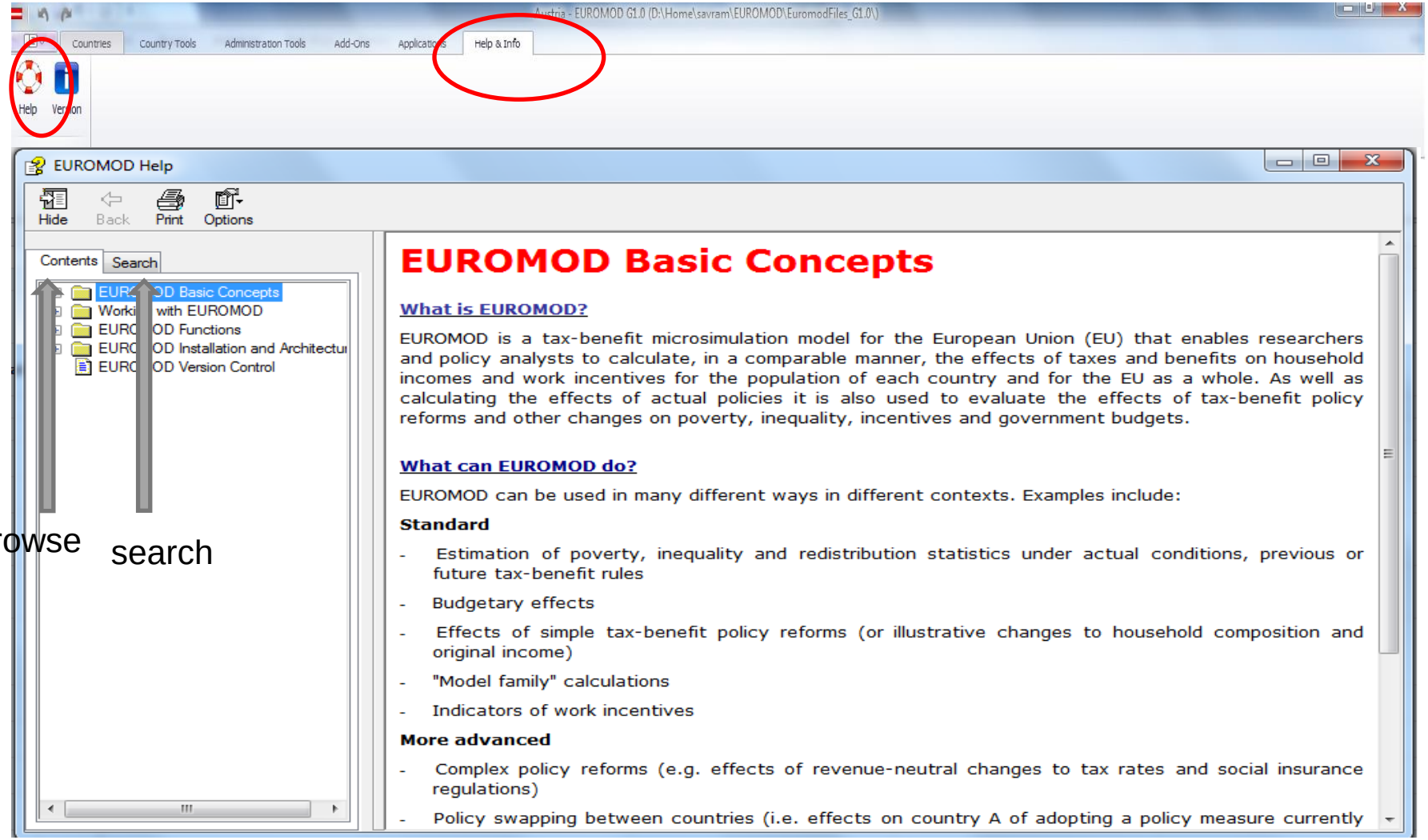


- Administration tools:
  - adding and deleting countries
  - accessing and administering the variables file
  - updating progress: overview of available policy systems and datasets

- More advanced :
  - available add-ons
  - applications (EXCEL based)

-

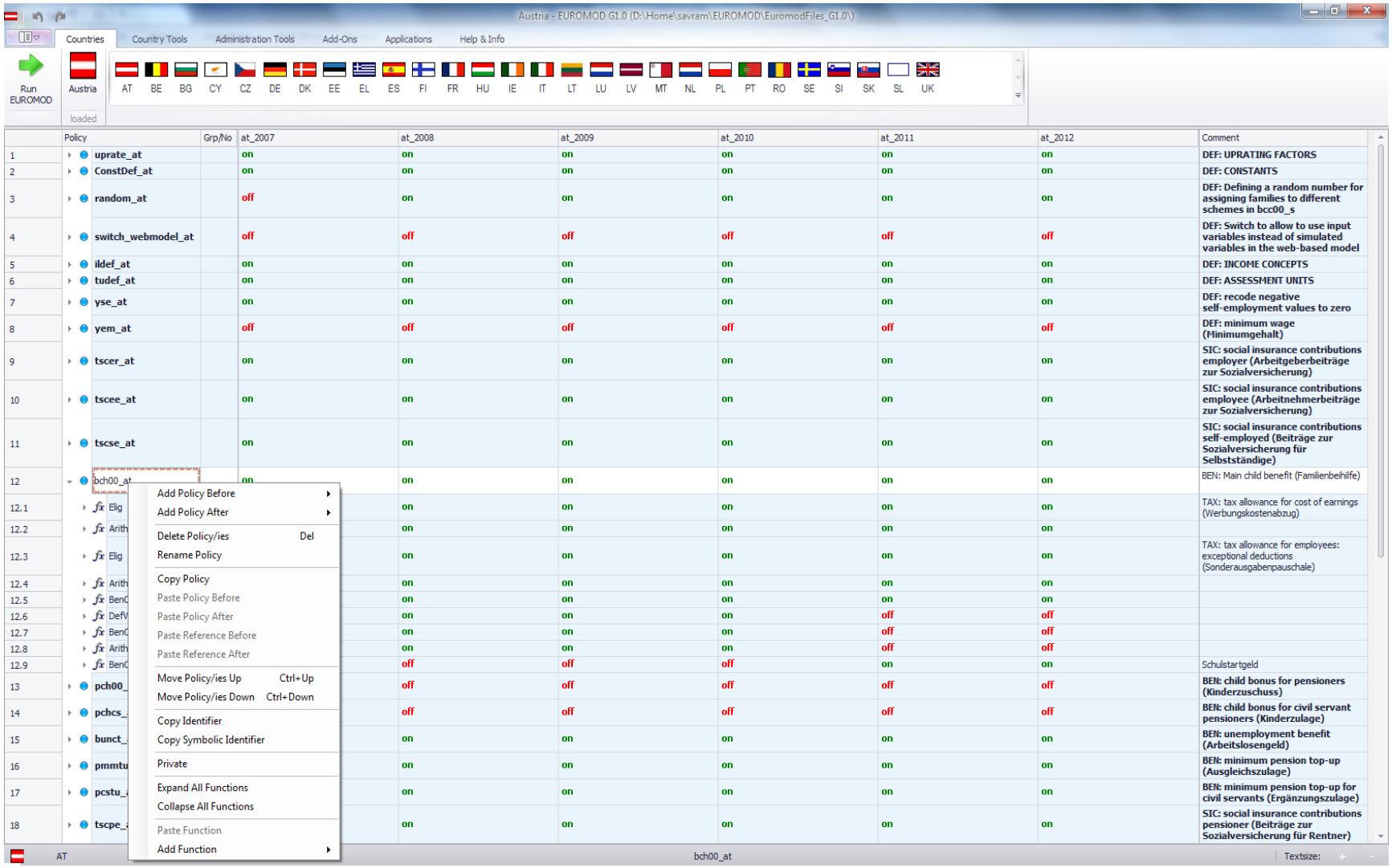
EUROMOD Help



browse

search

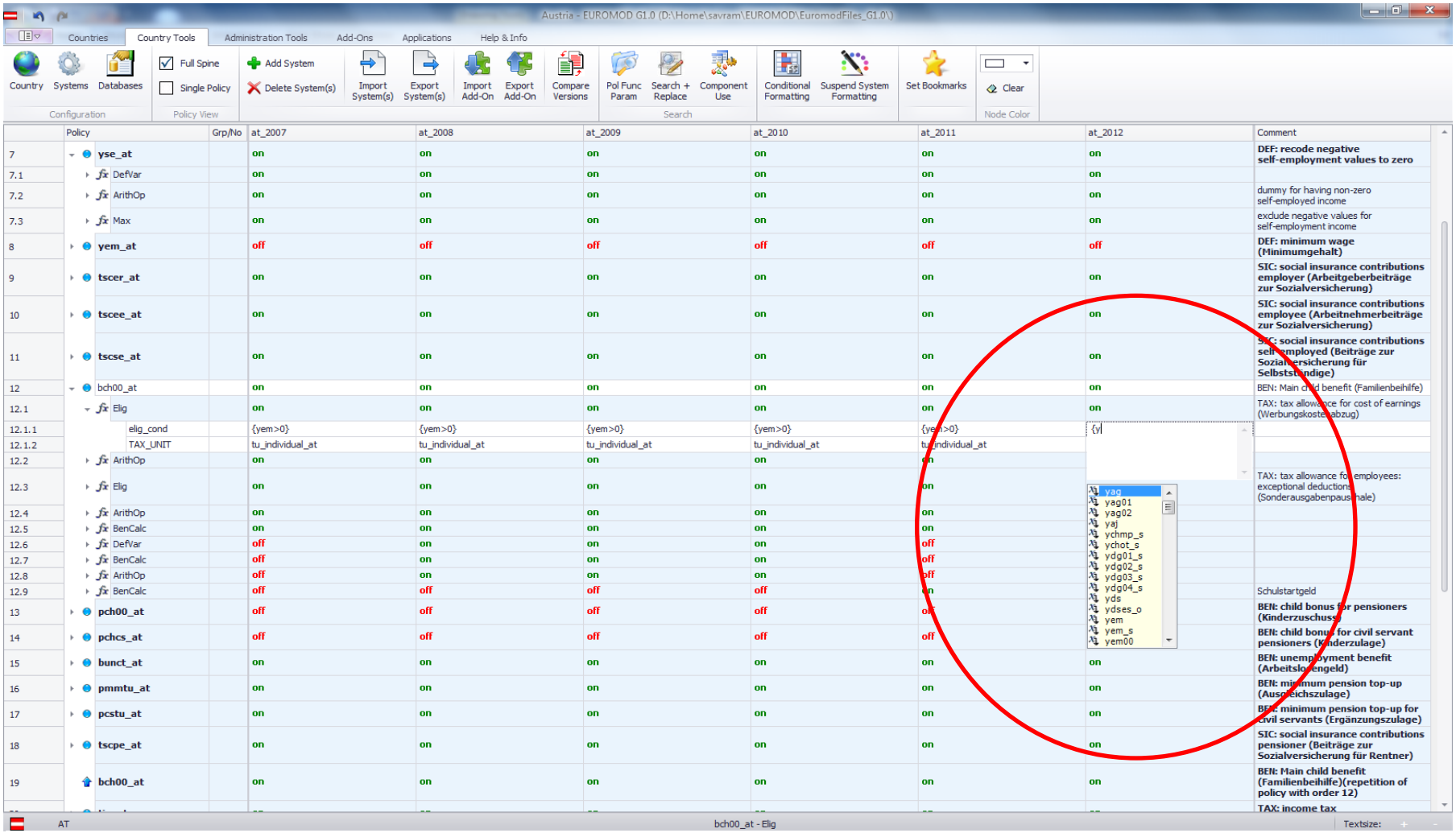
Context menus



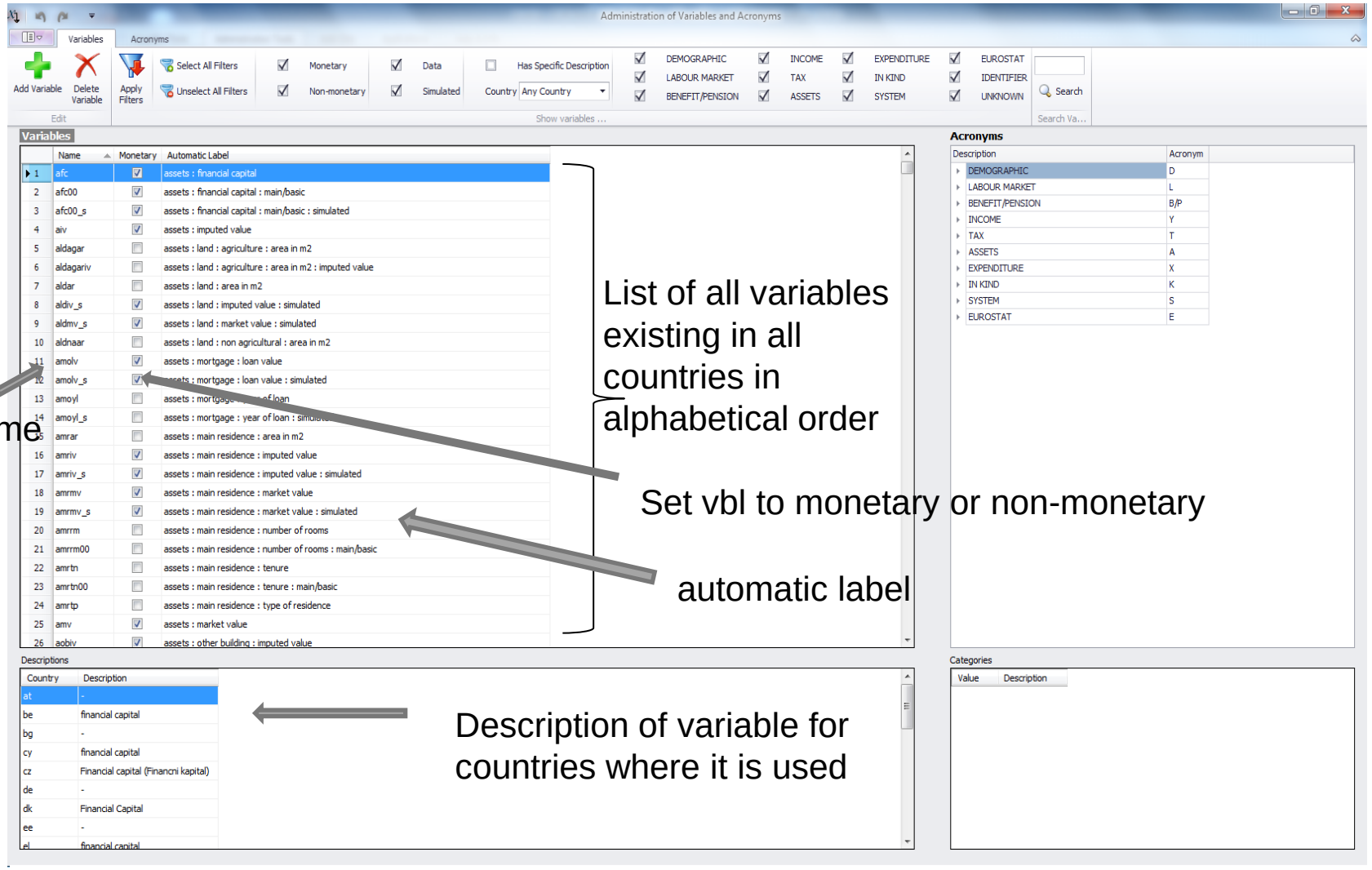
Context Menus

- Activated by right-clicking
  - Column headings
  - Row headings
  - Function headings/ parameter names
  - Comments
- Intuitive options controlling the respective elements

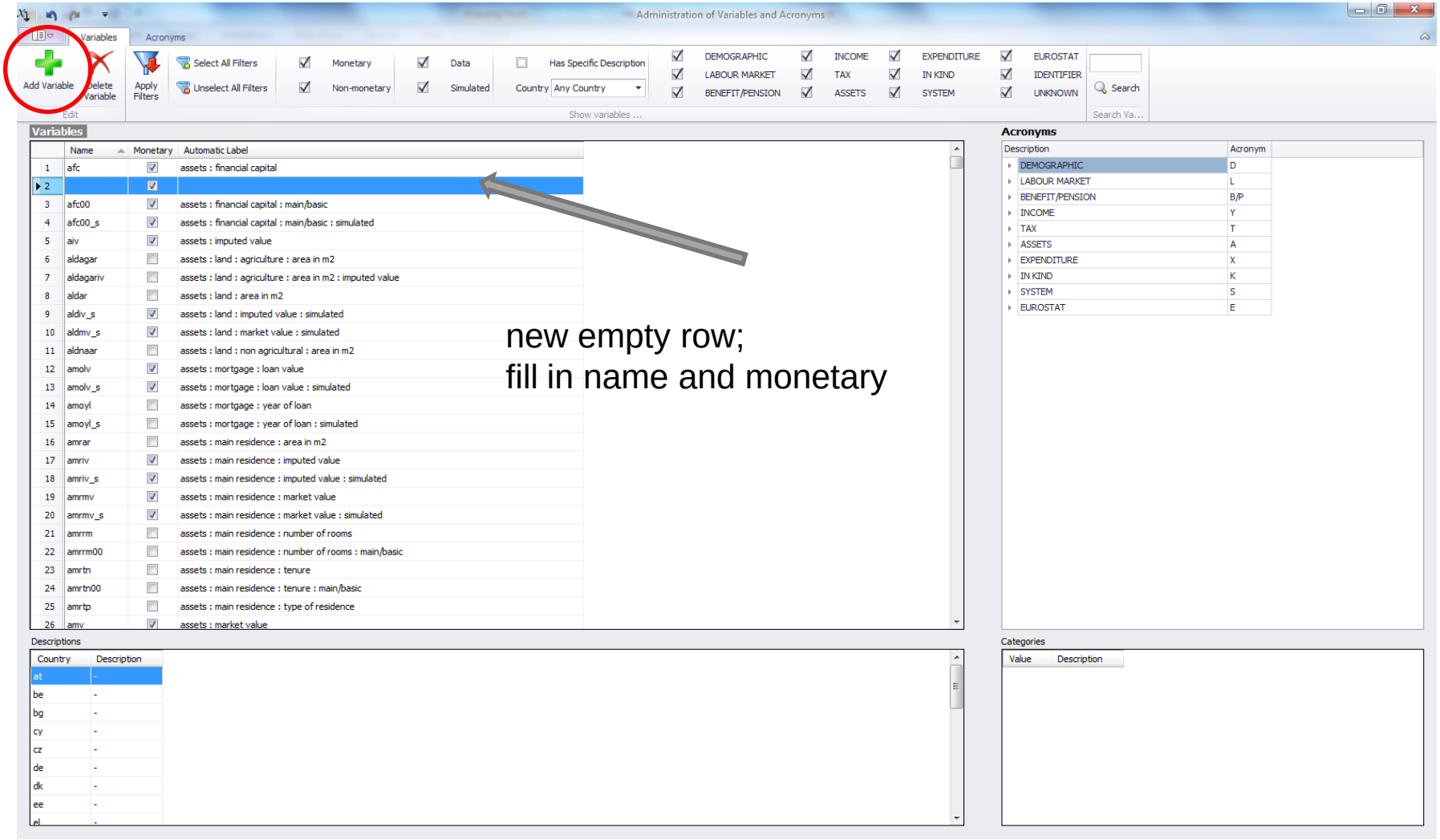
IntelliSense



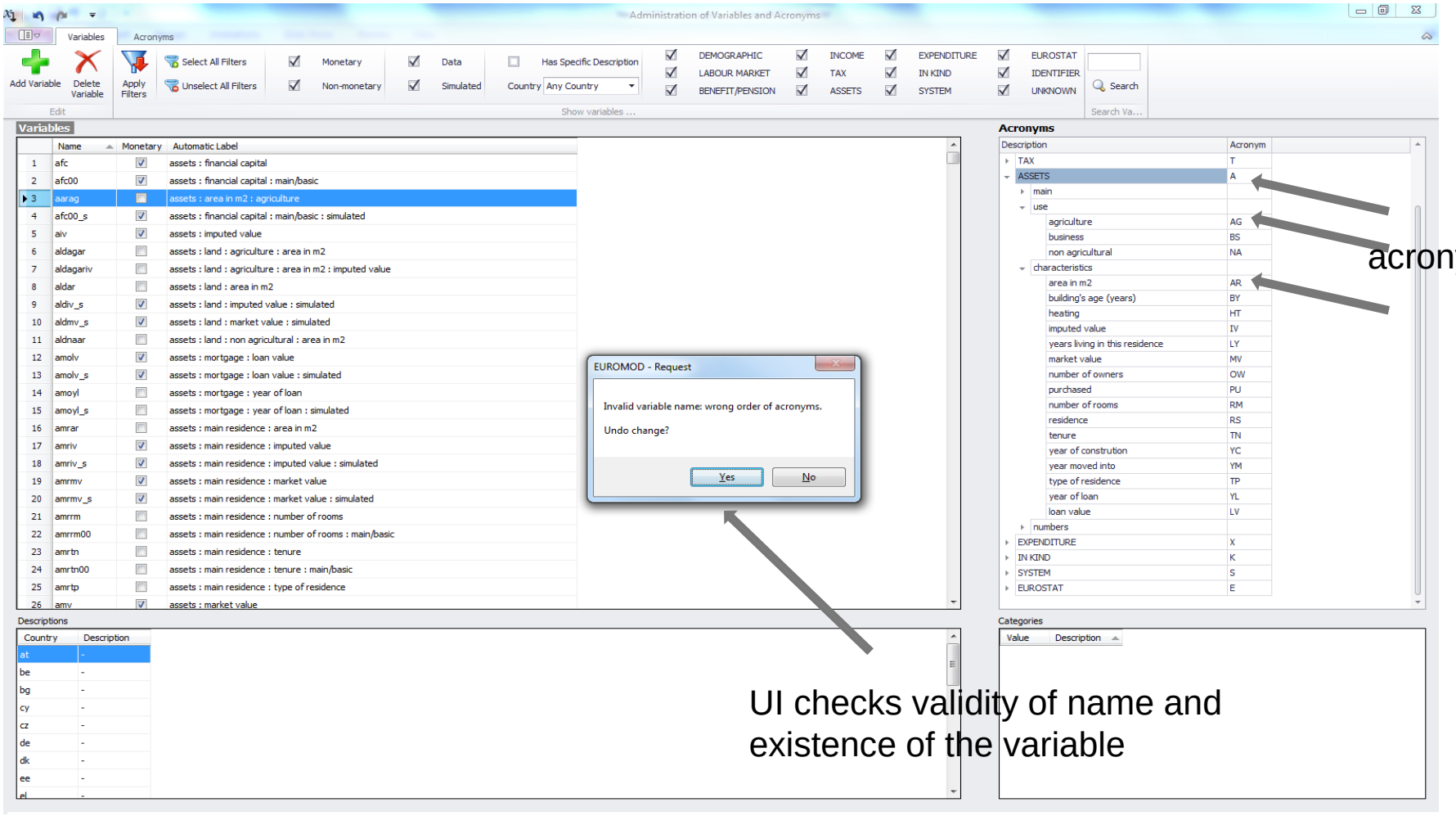
Variable Administration



Adding a variable



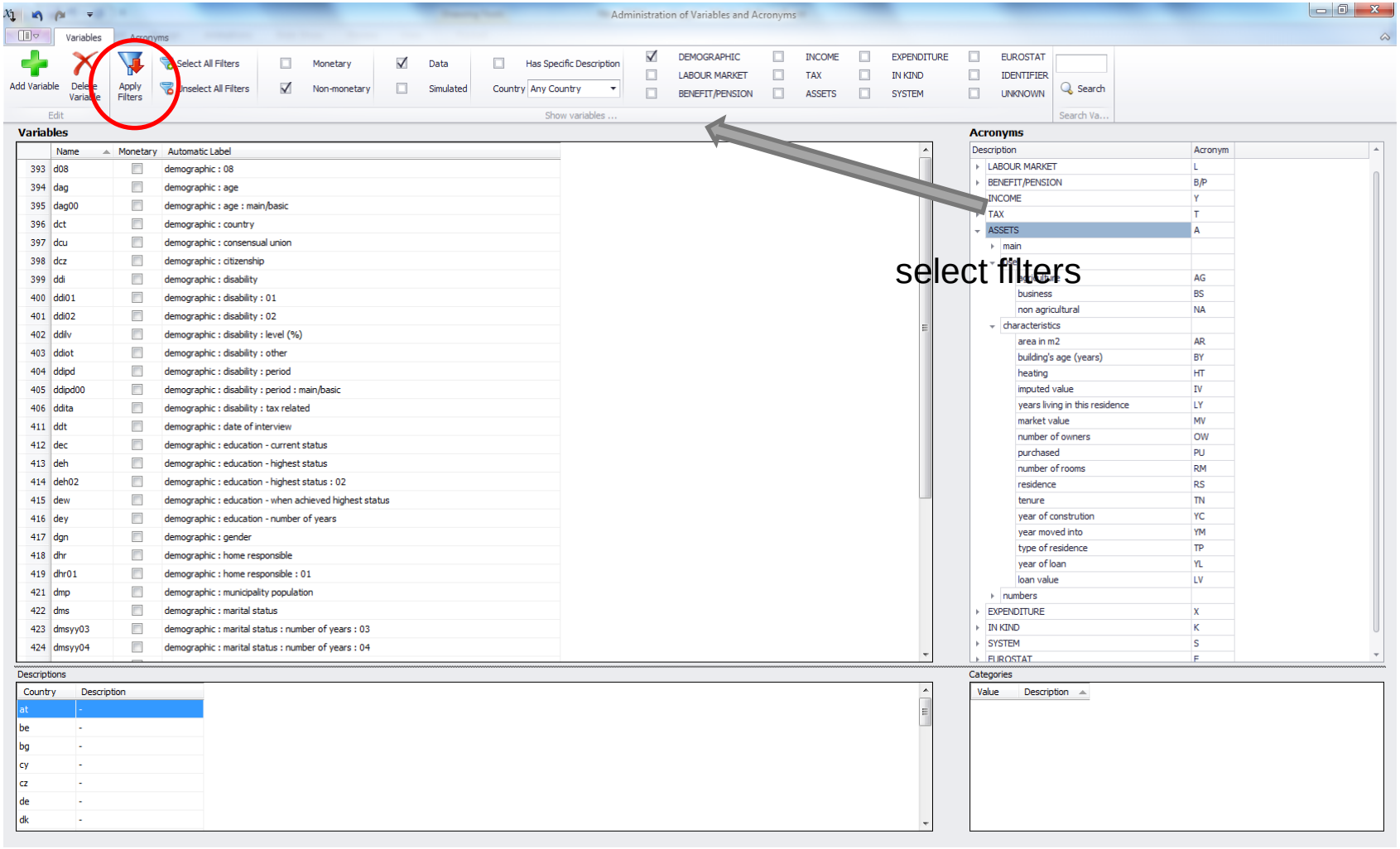
Naming a variable



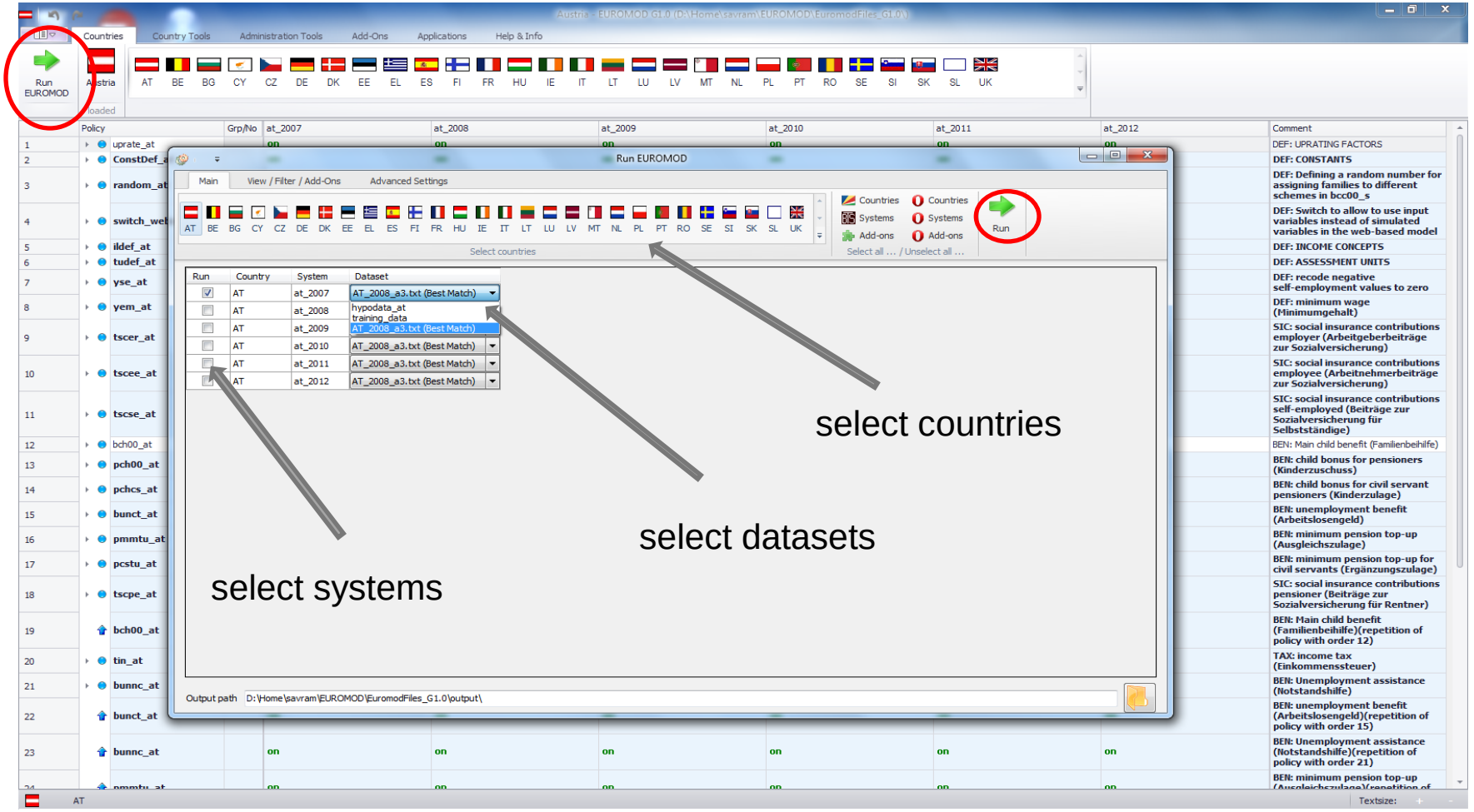
acronyms

UI checks validity of name and existence of the variable

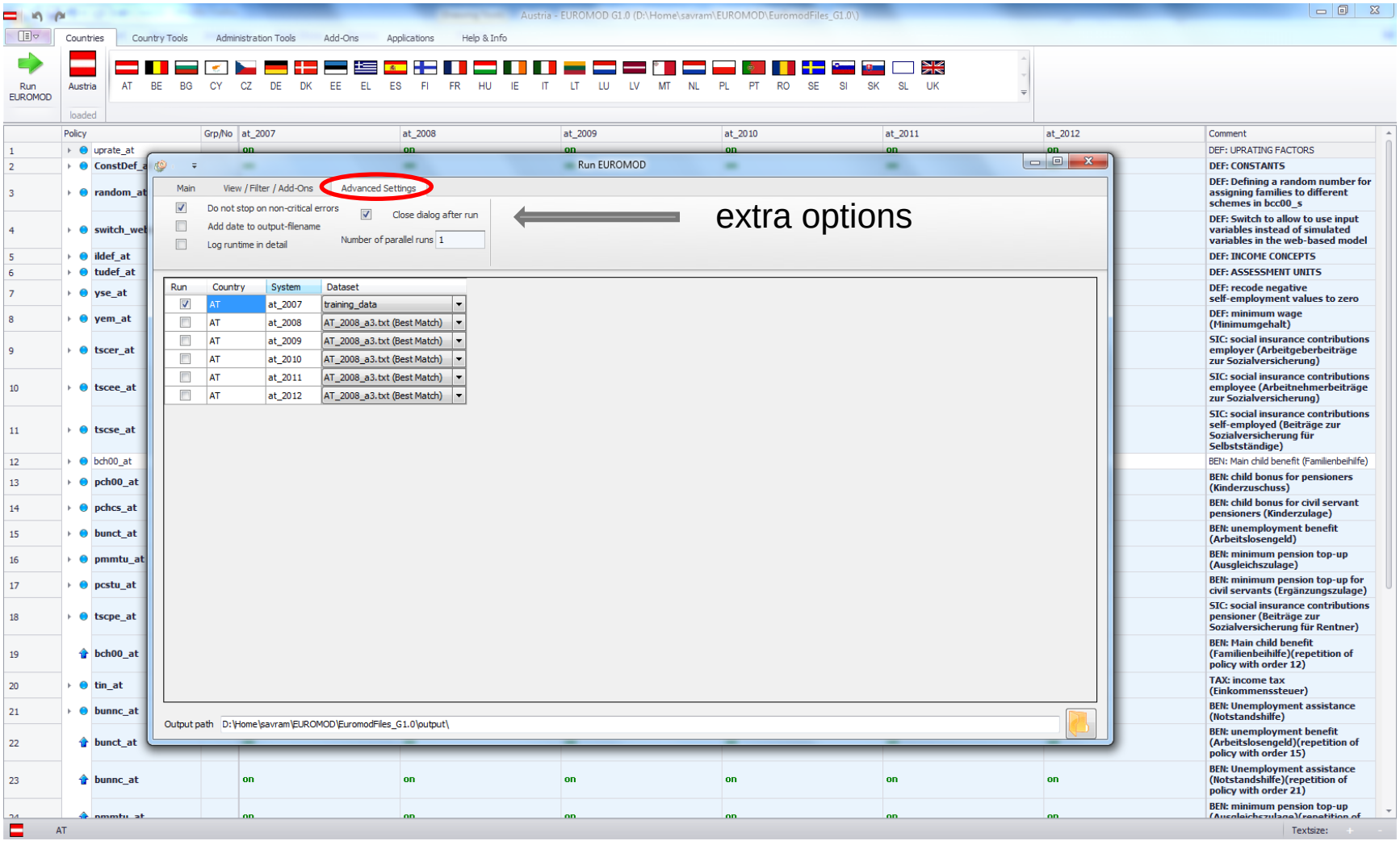
Filtering variables



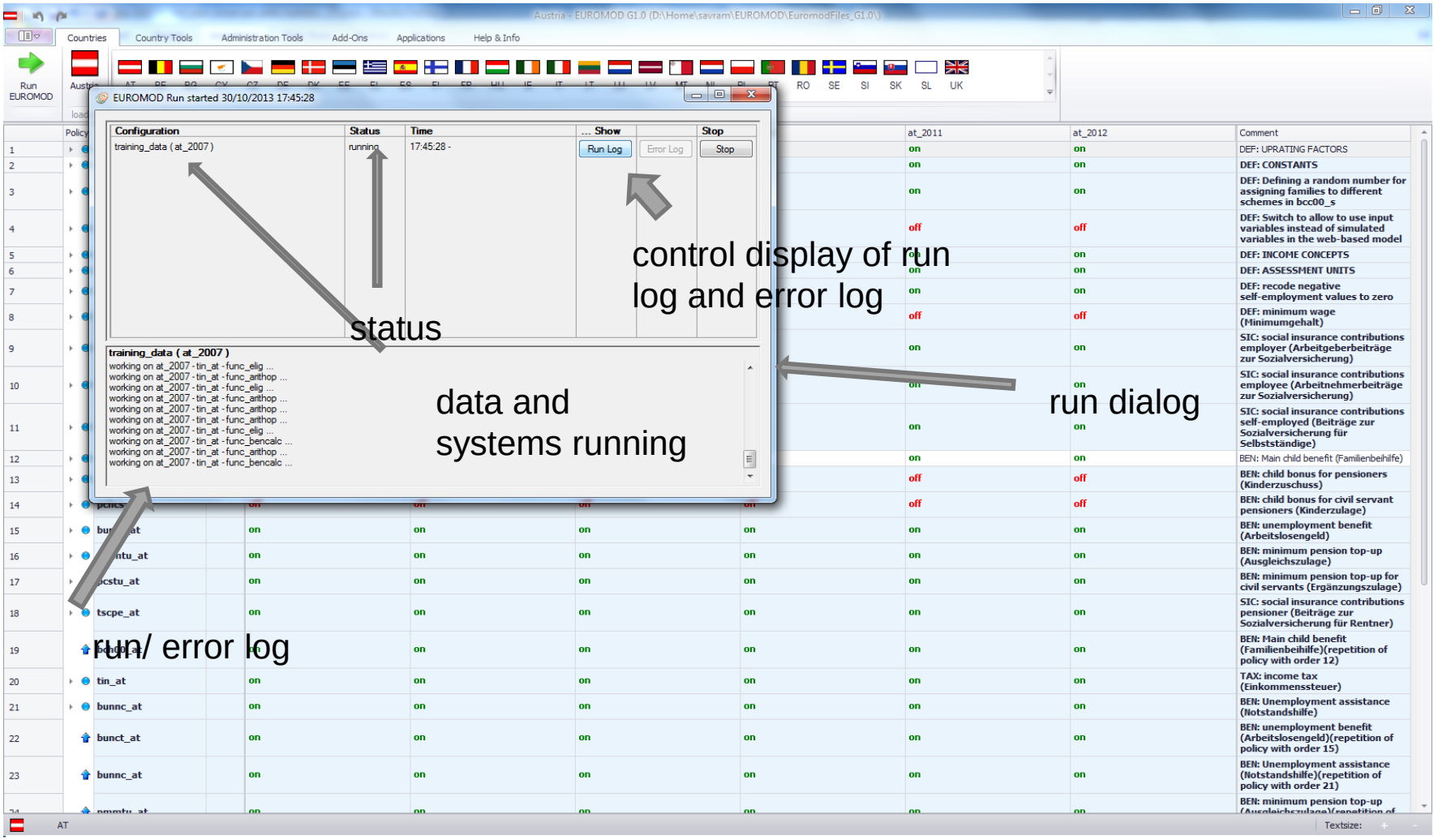
Running EUROMOD



Running EUROMOD

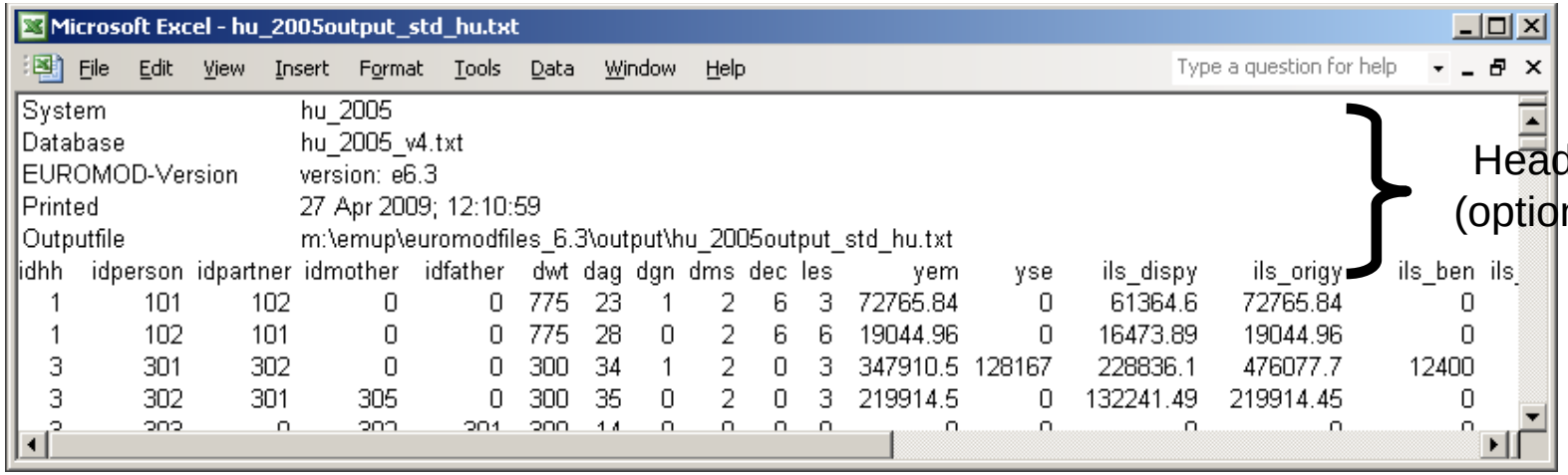


Running EUROMOD

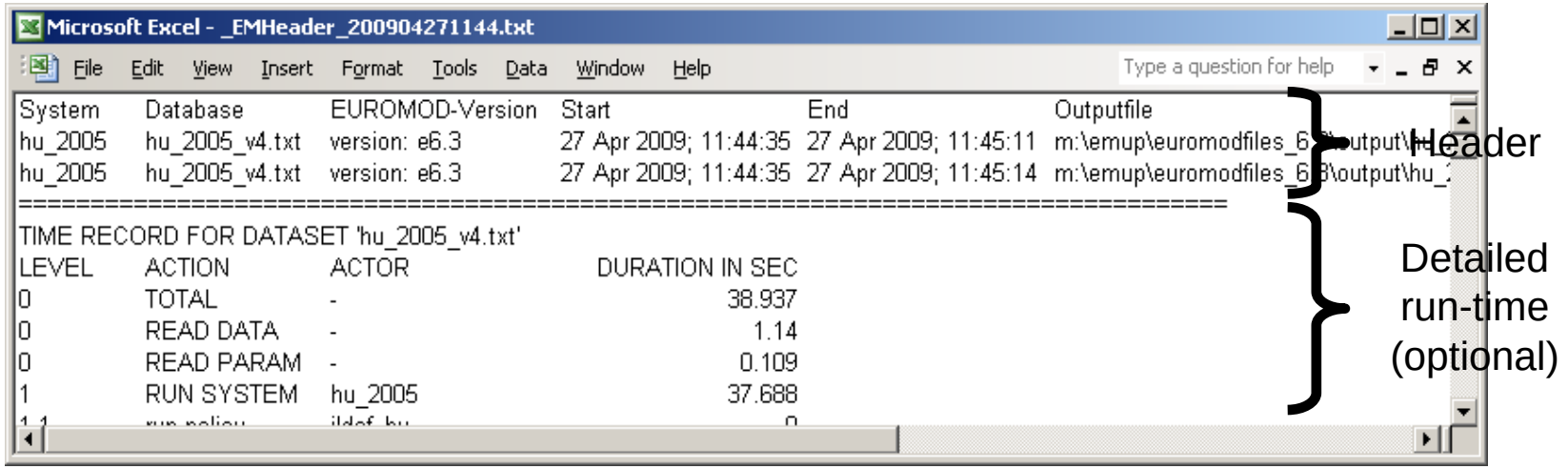


Output files

- micro-data (with an optional header)



- separate header file (optional)



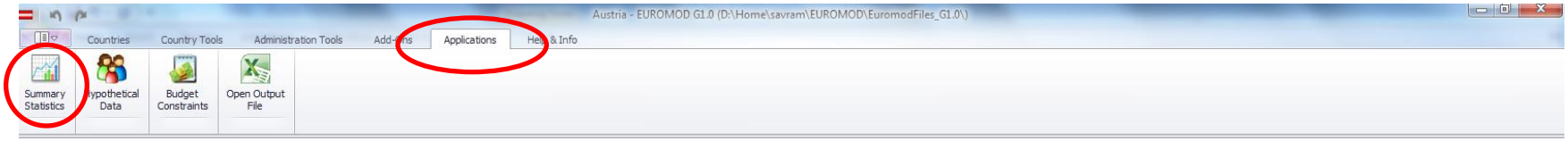
Output files

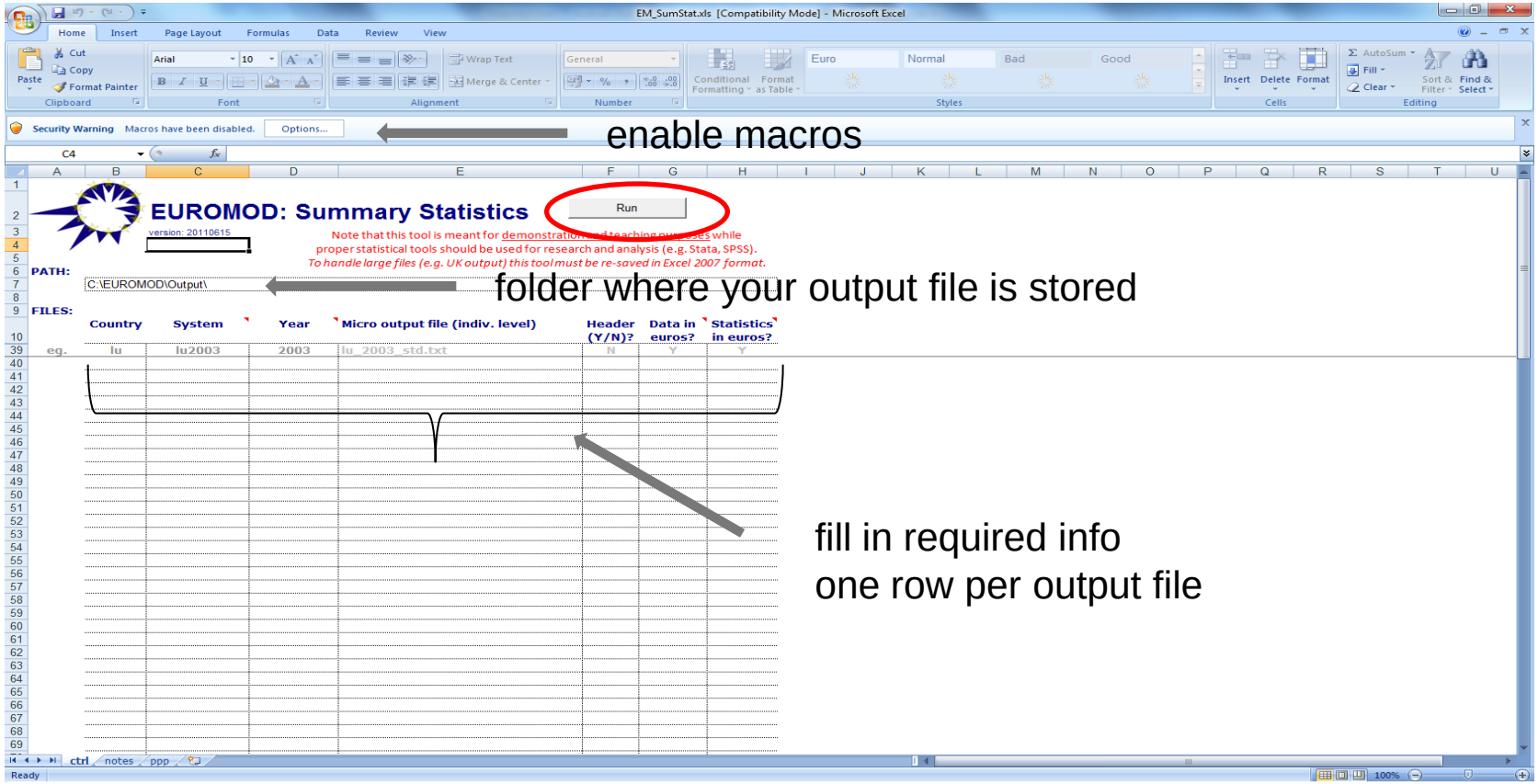
- Content defined in policy output_std_cc
- Usually including:
  - All variables present in the input microdata file
  - Simulated variables (i.e. simulated taxes and benefits)
  - Standardized income lists
  - (optional) non-standard income lists
  - (optional) temporary variables
  - (optional) Tax unit identification info
- Control level at which info is outputted (ex: individual, household etc.)

Summary Statistics Tool

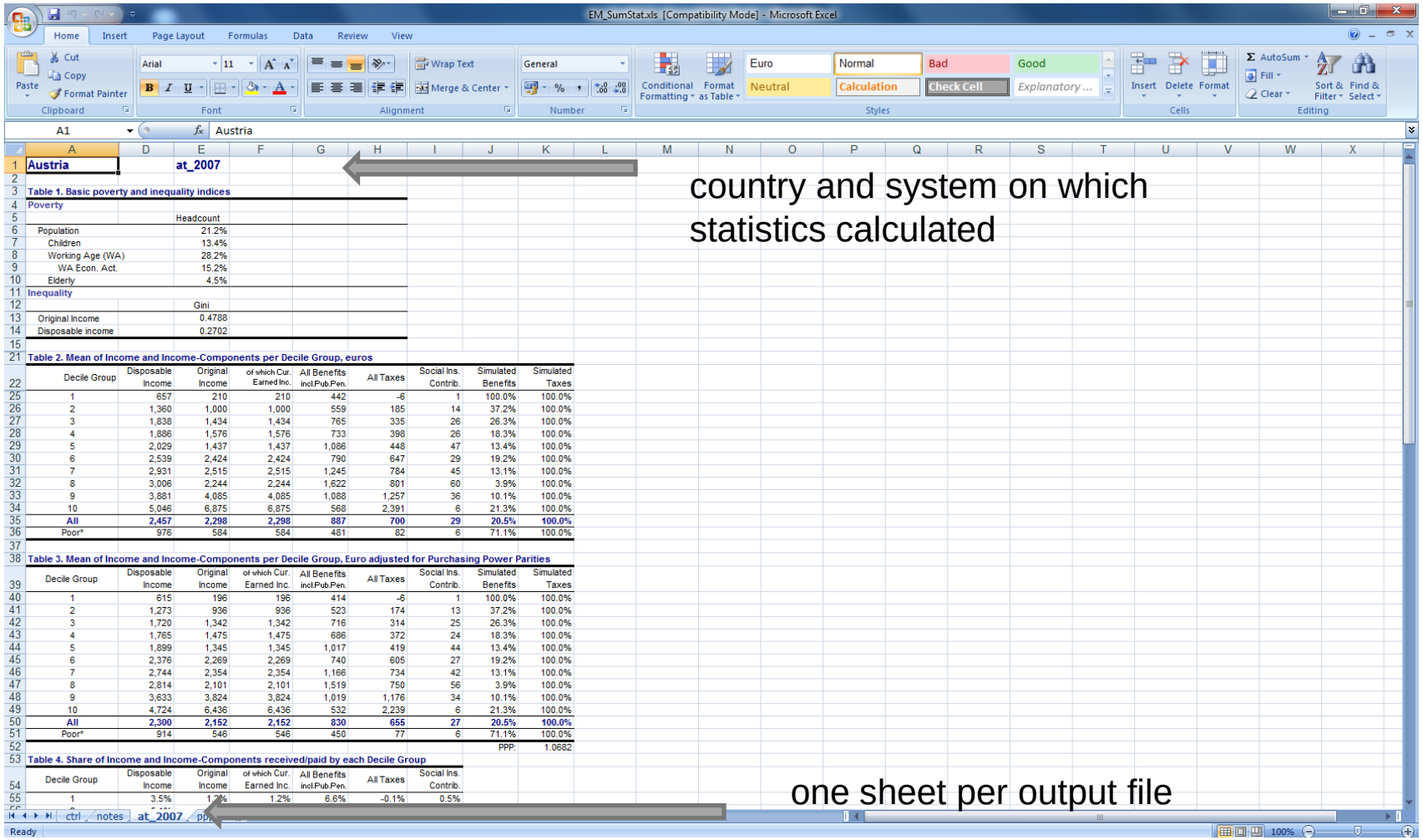
- Output of EUROMOD = micro-data
- Process using a statistical software package (ex. Stata)
- Only for training purposes- Summary Statistics Tool
- Computes a range of commonly used indicators and statistics:
  - poverty rates for the overall population and for selected groups and the Gini coefficient
  - distribution of household income, taxes and benefits by income group
  - demographic information on households by income group
- Currently in Excel
- Computed indicators are fixed and cannot be changed → not for 'real' analysis!!!
- 7 tables produced in Excel

Summary statistics tool



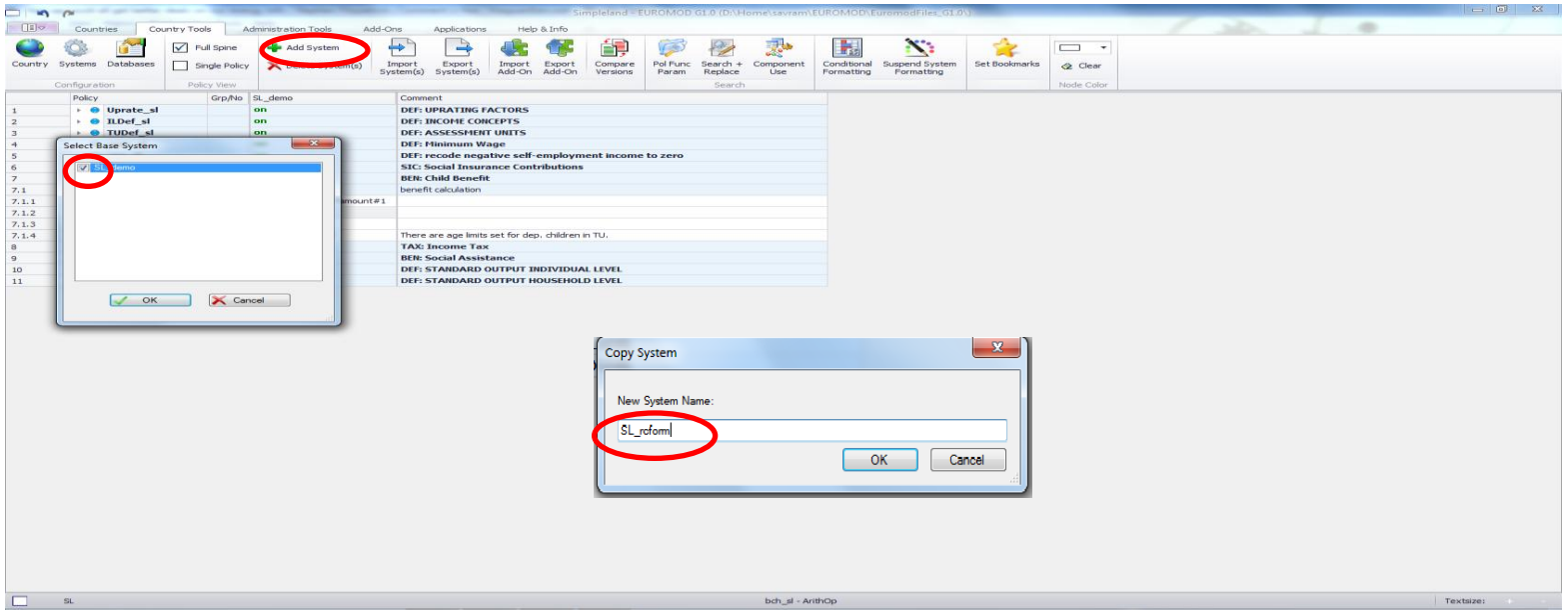


Summary Statistics Tool



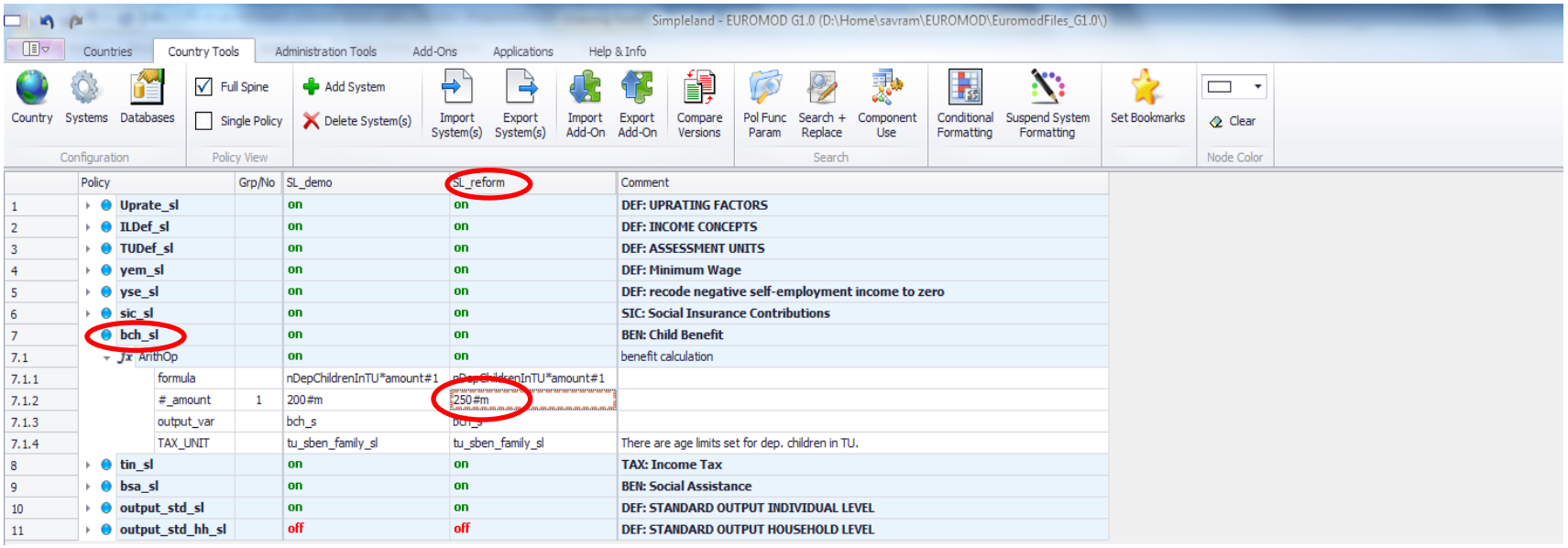
Implementing a simple reform

- Where:
  - Simpleland
- What:
  - make the child benefit more generous
- How:
  - Open Simpleland
  - Add a new system where your reform will be implemented



Implementing a simple reform

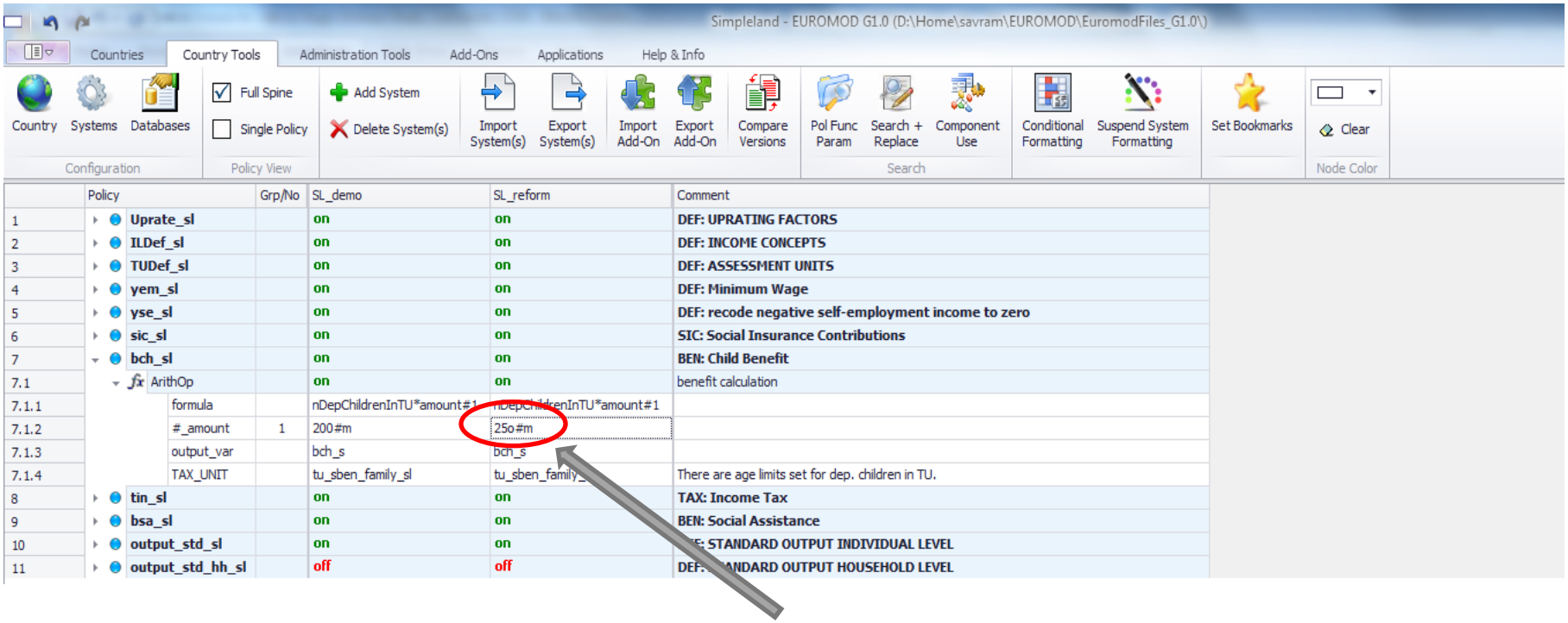
- How:
  - Open the child benefit policy
  - Make the changes in the new (reform) system



	Policy	Grp/No	SL_demo	SL_reform	Comment
1	**Uprate_sl**		on	on	**DEF: UPRATING FACTORS**
2	**ILDef_sl**		on	on	**DEF: INCOME CONCEPTS**
3	**TUDef_sl**		on	on	**DEF: ASSESSMENT UNITS**
4	**yem_sl**		on	on	**DEF: Minimum Wage**
5	**yse_sl**		on	on	**DEF: recode negative self-employment income to zero**
6	**sic_sl**		on	on	**SIC: Social Insurance Contributions**
7	**bch_sl**		on	on	**BEN: Child Benefit**
7.1	ArithOp		on	on	benefit calculation
7.1.1	formula		nDepChildrenInTU*amount#1	nDepChildrenInTU*amount#1	
7.1.2	#_amount	1	200#m	250#m	
7.1.3	output_var		bch_s	bch_s	
7.1.4	TAX_UNIT		tu_sben_family_sl	tu_sben_family_sl	There are age limits set for dep. children in TU.
8	**tin_sl**		on	on	**TAX: Income Tax**
9	**bsa_sl**		on	on	**BEN: Social Assistance**
10	**output_std_sl**		on	on	**DEF: STANDARD OUTPUT INDIVIDUAL LEVEL**
11	**output_std_hh_sl**		off	off	**DEF: STANDARD OUTPUT HOUSEHOLD LEVEL**

  - Run EUROMOD
  - Analyze results with the Summary Statistics Tool

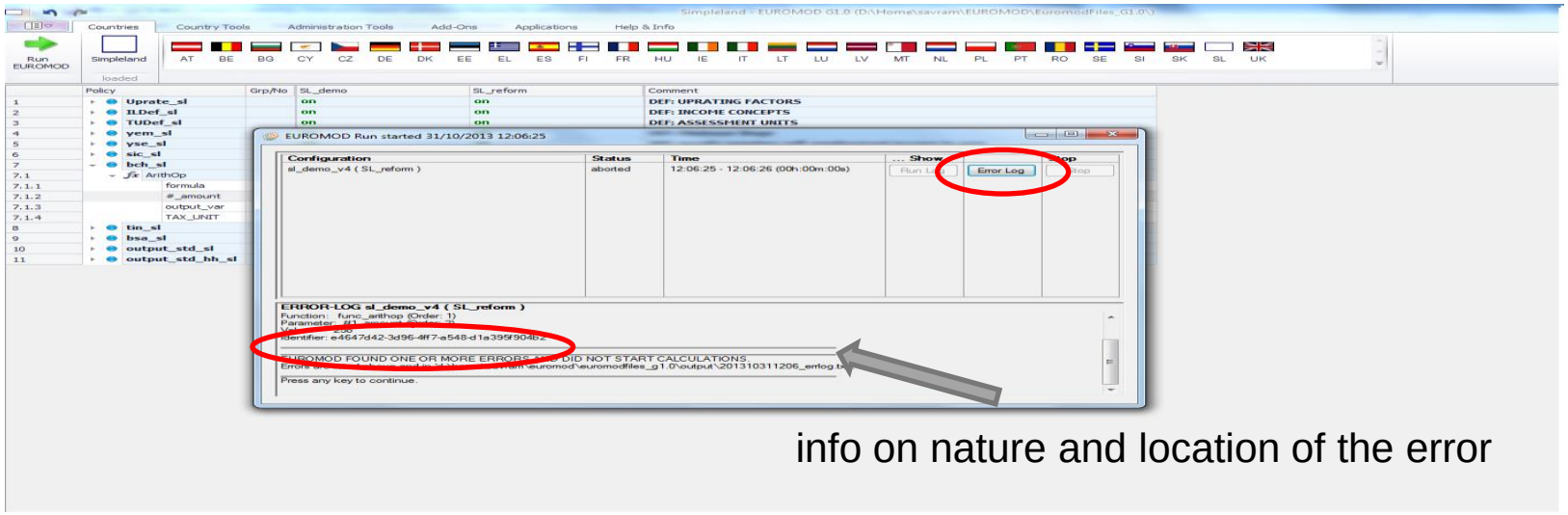
Error handling



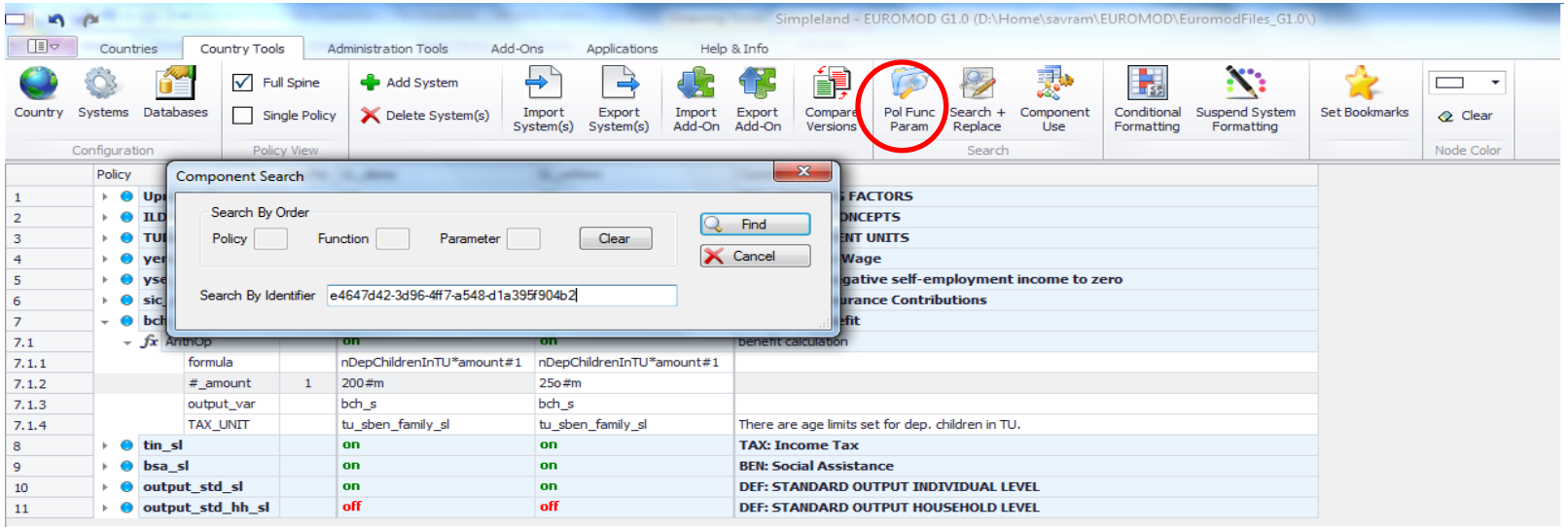
	Policy	Grp/No	SL_demo	SL_reform	Comment
1	**Uprate_sl**		on	on	**DEF: UPRATING FACTORS**
2	**ILDef_sl**		on	on	**DEF: INCOME CONCEPTS**
3	**TUDef_sl**		on	on	**DEF: ASSESSMENT UNITS**
4	**yem_sl**		on	on	**DEF: Minimum Wage**
5	**yse_sl**		on	on	**DEF: recode negative self-employment income to zero**
6	**sic_sl**		on	on	**SIC: Social Insurance Contributions**
7	**bch_sl**		on	on	**BEN: Child Benefit**
7.1	ArithOp		on	on	benefit calculation
7.1.1	formula		nDepChildrenInTU*amount#1	nDepChildrenInTU*amount#1	
7.1.2	#_amount	1	200#m	25o#m	
7.1.3	output_var		bch_s	bch_s	
7.1.4	TAX_UNIT		tu_sben_family_sl	tu_sben_family_	There are age limits set for dep. children in TU.
8	**tin_sl**		on	on	**TAX: Income Tax**
9	**bsa_sl**		on	on	**BEN: Social Assistance**
10	**output_std_sl**		on	on	**F: STANDARD OUTPUT INDIVIDUAL LEVEL**
11	**output_std_hh_sl**		off	off	**DEF: ANDARD OUTPUT HOUSEHOLD LEVEL**

produce an error

Error handling



info on nature and location of the error



Error handling

- Output folder-error log file (text format)
- Same info as in the running dialog box
- Error logs contain time stamp of their creation
- Info about EUROMOD version, policy system where error occurred and dataset used

Documentation

- MANUALS
  - Euromod Terminology
  - Running Euromod and Basic Concepts
  - Euromod Functions

all in built-in help

- COUNTRY REPORTS (CR)

(https://www.iser.essex.ac.uk/euromod/resources-for-euromod-users/country-reports)

- DATA DESCRIPTION DOCUMENTS (DRD)
- WORKING PAPERS

(https://www.iser.essex.ac.uk/euromod/working-papers)

Additional features

- Documentation
  - Country Reports
  - Data Requirement Documents
  - Manuals
  - Recipes
  - Working Papers
- Tools:
  - Summary statistics
  - Budget constraint charts (for standard hh types)
  - METRs calculation

Country report

1. Basic information
   - background information (e.g. country statistics)
   - brief description and statistics of all policies
2. Simulation of taxes and benefits in Euromod
   - scope and order of simulation
   - detailed information on simulated policies (incl. assumptions)
3. Data
   - general description, sample quality and weights
   - data adjustment, imputations and assumptions
4. Validation
   - policy validation
   - income distribution validation: poverty and inequality
   - “health warnings”

Access to model and data

- Web http://www.iser.essex.ac.uk/research/euromod
  - Summary statistics
  - Documentation: Country Reports, Working Papers ….
- Model is freely available for non-commercial use
  - Contact euromod@essex.ac.uk to obtain the link for downloading (incl. manuals)
- Data access conditions set out by the original data provider
  - EU-SILC (UDB): (for now) EUROMOD users need to join our project network contract with Eurostat
  - Other data: relatively straightforward procedures
- Free training courses

Responsibilities of EUROMOD hand-on users

- Respect data access rules and conditions
- Acknowledge EUROMOD when it is used
- Submit all papers using EUROMOD for inclusion in the WP series
- Take responsibility for your own use of the model
- Tell us about bugs or errors
- Keep us informed about what you are working on and when you are working actively: that way we can keep you informed of relevant changes

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/research/euromod
  - Country Reports
  - Recipes
  - Working Papers

Useful links and references

- International Microsimulation Association http://www.microsimulation.org/
- International Journal of Micosimulation http://www.microsimulation.org/IJM/index.htm
- Sutherland H. and F. Figari, 2013, EUROMOD: the European Union tax-benefit microsimulation model, *International Journal of Microsimulation* 6(1) 4-26.
- Figari F., A. Paulus and H. Sutherland, 2013, Microsimulation and Policy Analysis, in Handbook of Income Distribution Volume 2, edited by A. B. Atkinson and F. Bourguignon, Elsevier, forthcoming.
- Lelkes O. and H. Sutherland (eds), 2009, *Tax and Benefit Policies in the Enlarged Europe: Assessing the Impact with Microsimulation Models,* Ashgate.
- Bourguignon F. and A. Spadaro, 2006, Microsimulation as a tool for evaluating redistribution policies, *Journal of Economic Inequality* 4(1): 77-106.
- Bargain O. (ed), 2006, *Microsimulation In Action: Policy Analysis in Europe using EUROMOD,* Research In Labor Economics Vol 25, Elsevier.