*Annex 1 – User manual*

EUROMOD INDIRECT TAX TOOL – MANUAL

1. INTRODUCTION

The Indirect Tax Tool (or ITT) imputes expenditures into the EUROMOD output, and calculates VAT and excises. This tool expands EUROMOD's functionality such that policy makers and researchers can analyse the effects of indirect tax reforms, in addition to the analysis of direct tax and benefit reforms. This manual is intended to guide you through the ITT, and to explain its functionality. For a more technical documentation of the estimation and imputation process, and of the simulation of indirect taxes we refer to the project report. The ITT is developed as part of a research project for the European Commission's Joint Research Centre in Seville.

2. GETTING STARTED

Installation

Use the ITT installer to install the tool in EUROMOD. The ITT will appear in the *Application* menu, under the *EUROMOD plugins* section.
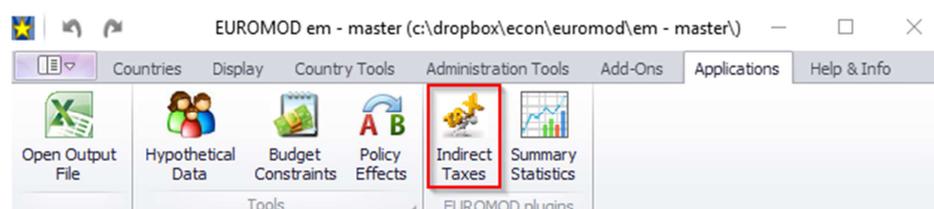
Note that the ITT requires a EUROMOD version of 1.13.4 or later.

Input

The ITT requires three input files to run:

(1) the *prediction_data_CC_bud20yy_pol20yy.xlsx* file containing the information form the estimation process as well as which goods and services are subject to VAT and excise duties, the file also contains information on the general uprating index;

(2) the *cc_yyyy_tax.txt*, which contains information on VAT rates, specific and ad valorem excises, and on consumer prices for the goods subject to specific excises (in the baseline)

(3) the *cc_yyyy_tco.txt,* which contains the household information, including household disposable income, needed to impute the expenditures.

Imputation of the baseline expenditures and calculation of baseline tax rates

To upload the data, go to the *File* menu, choose *Load data & parameters*, and click the *All* button. You may also choose to load the three files separately.
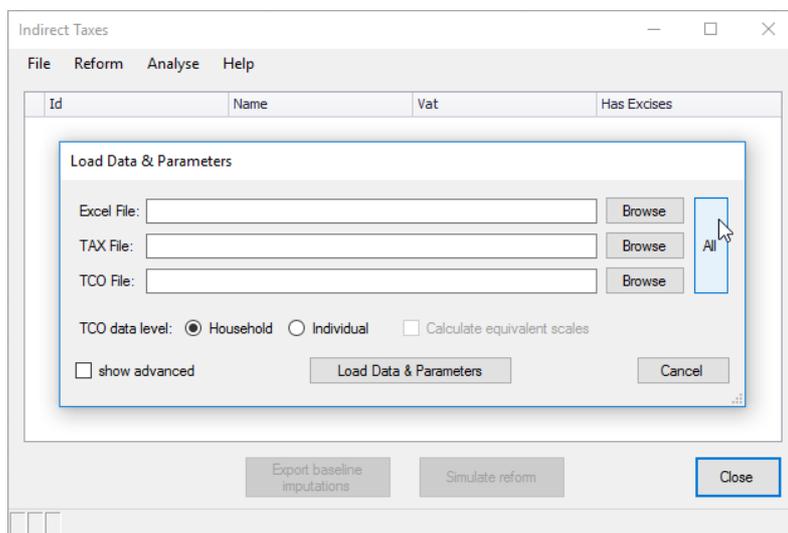
The ITT will ask you to upload the three files. Make sure that the files have the correct suffixes. Select whether the data in the tco-file contains information at individual or on households level, and click the *Load Data & Parameters* button. The ITT will start the imputation process, and will calculate the indirect taxes for each commodity group.
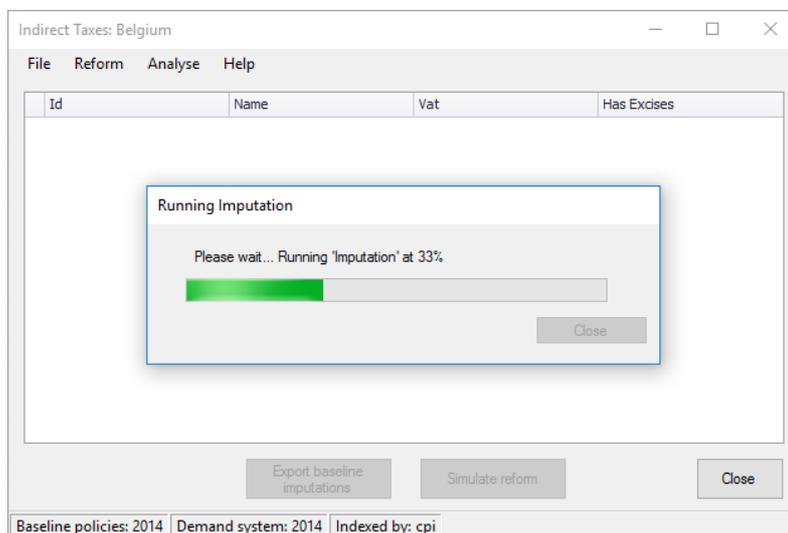
Interface

The main interface of the ITT lists the commodity groups, containing 15 non-durable commodity groups and one group consisting of durable goods, and reporting the tax rate. The tax rate equals the total of VAT and excises as a percentage of producer prices.

The categories can be expanded such that the different goods and services within each category are listed. This detailed view also shows which VAT is applicable to each of the goods, and whether the good is subject to excises.

On the bottom of the window *Baseline policies* refers to the indirect tax policy year (the year included in the name of the *cc_yyyy_tax.txt*), *Demand system* refers to the year of the Household Budget Survey that was used for the estimation of the Engel curves. Finally the banner indicates which general uprating indicator was used in the process.

Exporting baseline imputations

By clicking the Export baseline imputations, you can export the baseline results. The ITT will then create four txt files:

- cc_yyyy_cat_info_baseline.txt: contains the aggregate expenditures and indirect tax rates for each of the commodity groups.
- cc_yyyy _com_info_baseline.txt: contains the information on the different commodities, the reported expenditures on each of the goods in the Household

Budget Survey, which commodity group they belong to, and which VAT rate they are subject to.

- cc_yyyy _tco_hh_baseline.txt: contains for all households the baseline output of the imputation, including the monthly expenditures, and monthly VAT, and specific and ad valorem excises paid.
- cc_yyyy _temp_results_baseline.txt: contains for all households the covariates used in the imputation process from the *cc_yyyy_tco.txt* file.

Saving a session

In case you want to save the session into a xml-file, by choosing *Session – Save (as)* in the *File*-menu. The session can later be restored easily by selecting *Session – Open* in the same menu.

3. SIMULATING A REFORM

The ITT allows for a variety on reforms:

- a change in VAT rates (both the level of the rate, and the attribution of products and services to the different rates;
- a change in excises;
- a change in disposable household incomes.

Simulation of a change in the VAT rates and/or the excise duties

Select *Edit constants* in the *Reform* menu.

Manage Constants		
Name	**Baseline Value**	**Reform Value**
▶ $VAT_ZERO	0	0
$VAT_REDUCED1	0.06	0.06
$VAT_REDUCED2	0.12	0.12
$VAT_STD	0.21	0.21
$PRICE_BEER_TABLE	231.2	231.2
$SPECIFIC_BEER_TABLE	9.2	9.2
$PRICE_BEER_LAGER	231.2	231.2
$SPECIFIC_BEER_LAGER	23.1	23.1
$PRICE_BEER_HEAVY	712.9	712.9
$SPECIFIC_BEER_HEAVY	29.5	29.5
$PRICE_SPIRITS	2258	2258
$SPECIFIC_SPIRITS	847.6	847.6

Reset all to Baseline   OK   Cancel

This window portrays the baseline and reform vat rates and excises values, as well as the consumer prices of the goods subject to excise duties. You can enter new values for the vat rates and excises in the *Reform Value* column.

Changing the attribution of excises to products

In case you want to change the excise duty that is attributed to a specific commodity, you can open the *Manage Excises* window in the *Reform* menu. Here you can select different available specific excises from the drop-down menu.
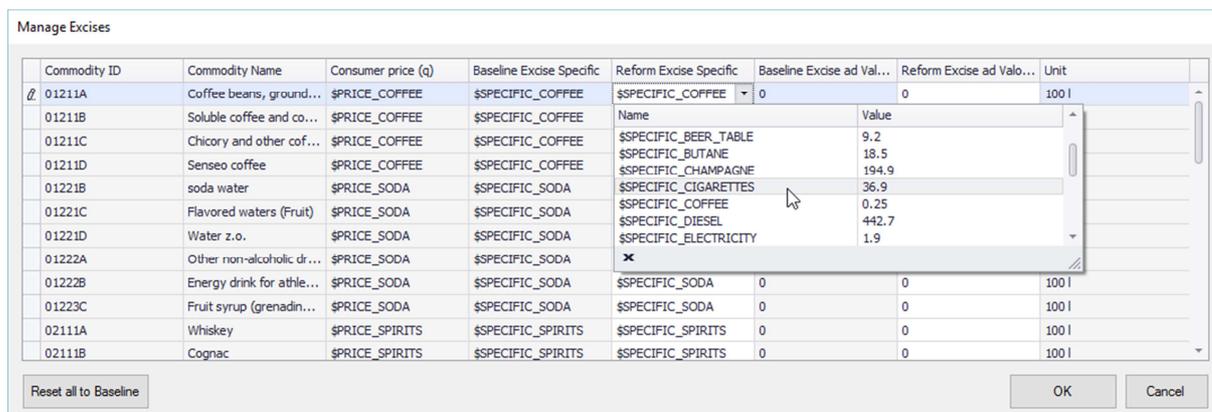
Changing the attribution of VAT to goods or services

You can easily change the VAT rate that applies to a specific good or service by clicking *Edit VAT (for detailed groups)* in the *Reform* menu. You can click on the individual commodity goods (or services) and use the drop-down menu to change the VAT-rate. Remember that you can change the level of each of the VAT-rates in the *Edit constants* window.
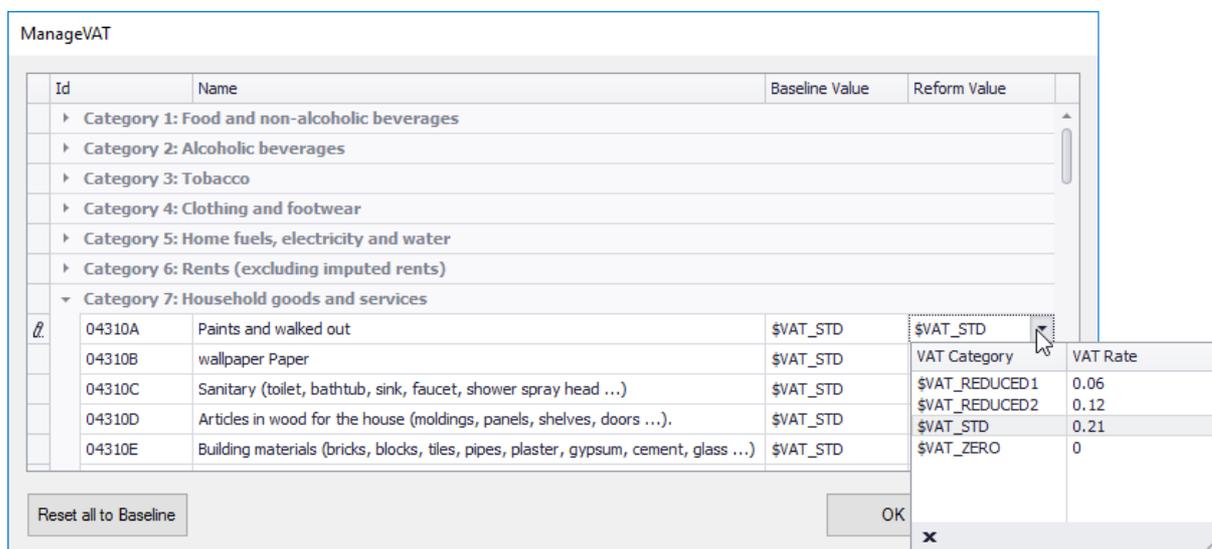
Simulating the reform

Once you are finished with the adjustments to the baseline indirect tax system you can click *Simulate reform*.

The tool provides you with the option to import new disposable household incomes, such that an integrated policy reform of a change in direct and indirect tax system becomes feasible. By clicking *Simulate* the ITT simulates new expenditures and indirect taxes, both under the assumption of households consuming constant quantities, and under the assumption of households consuming the same shares of their income on each of the different commodity groups.

The results are exported in a tab-delimited txt file.

4. OUTPUT AND THE ANALYSIS TOOL

The ITT has a build-in analysis-tool, which can be accessed by selecting *Analyse results* in the *Analyse* menu. Then click *Add files* to upload one or more output files to analyse. Note that it is possible to run the *Analysis Tool* for output of different simulation results, and for different countries at once.
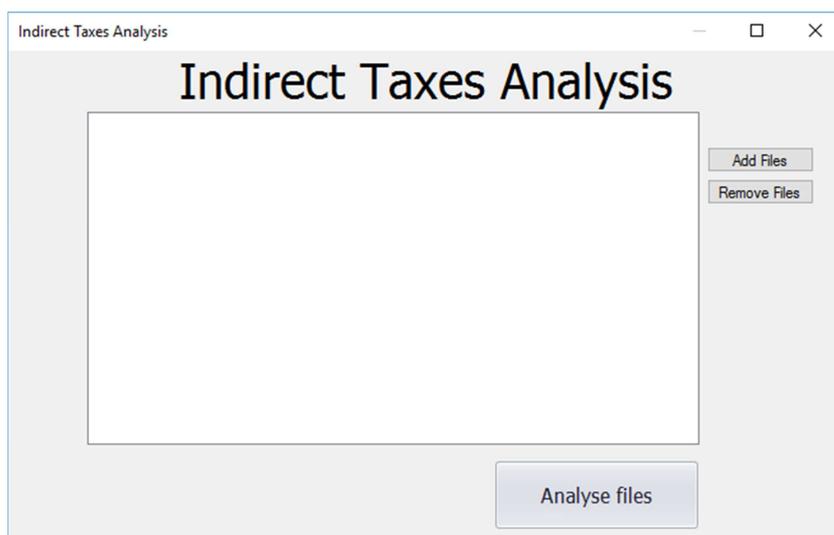
Running the analysis of a given output file (by clicking the *Analyse files* button) generates an output screen, containing a number of tables describing the levels and distribution of income, expenditures and indirect taxes in the baseline and in the reform scenario, and that present a selection of welfare measures.

The results are grouped by four tabs (on the bottom of the window), the names of which start with the output file(s) name(s), followed by a reference to the four output categories:

(1) base: results in the baseline
(2) refcq: results of the reform simulation, assuming constant quantities
(3) refcs: results of the reform simulation, assuming constant expenditure shares
(4) welfare: results of the welfare metrics

Levels and distribution of income, expenditures and indirect taxes

Results under tabs (1) – (3) are organised identically: Table X.1 to Table X.7. All results are calculated using survey weights and shown in the currency of EUROMOD output files.

- Table X.1: Total disposable income, expenditures and indirect taxes (in million);
- Table X.2: Mean household disposable income, total expenditure and indirect taxes by income decile;
- Table X.3: Mean household disposable income, total expenditure and indirect taxes by expenditure decile;
- Table X.4: Incidence of indirect taxes by income decile, % of household disposable income and total expenditure;
- Table X.5: Incidence of indirect taxes by expenditure decile, % of household disposable income and total expenditure;
- Table X.6: Mean household indirect taxes by expenditure category and income decile;
- Table X.7: Mean household indirect taxes by expenditure category and expenditure decile.

Monetary amounts shown are unequivalised and in monthly terms unless otherwise specified. Income deciles are constructed on the basis of equivalised household disposable income (using the modified OECD equivalence scale), with an equal number of households in every decile group. Expenditure deciles are constructed on the basis of equivalised household total expenditure (using the modified OECD equivalence scale), with an equal number of households in every decile group. Households with zero total baseline expenditure are excluded from calculations.

Welfare effects

The fourth tab on the bottom contains the effect on the levels and the distribution of a selection of welfare measures.

Indirect Taxes Analysis - Results

Results for Belgium 2014 (r_be_2014_tco_hh_reform.txt)

Table 4.1 | Table 4.2 | Table 4.3

Total fiscal and welfare effects (in million)

Total	Constant quantities (monthly)	Constant shares (monthly)	Constant quantities (annual)	Constant shares (annual)
Change in disposable income	566.96	566.96	6803.56	6803.56
Change in expenditures	0.00	539.46	0.00	6473.53
Change in indirect taxes	0.00	64.84	0.00	778.10
Change in VAT	0.00	54.65	0.00	655.76
Change in excises	0.00	10.20	0.00	122.34
Change in specific excises	0.00	8.44	0.00	101.23
Change in ad valorem excises	0.00	1.76	0.00	21.12
Compensating Variation (CV)	0.00		0.00	
Equivalent Variation (EV)		0.00		0.00
CV welfare effect	566.96		6803.56	
EV welfare effect		566.96		6803.56

r_be_2014_tco_hh_reform - base | r_be_2014_tco_hh_reform - refcq | r_be_2014_tco_hh_reform - refcs | r_be_2014_tco_hh_reform - welfare

| Definitions | | Export | | Close |

The three tables are portraying:

- Table 4.1: total fiscal and welfare effects (in million);
- Table 4.2: mean household welfare change by income decile;
- Table 4.3: mean household welfare change by expenditure decile.

The welfare effect can be decomposed in the effect of the change in disposable income, and the change in prices. Each time two welfare measures are provided: the compensating variation (CV) and the equivalent variation (EV). The compensating variation is the monetary compensation a household should receive in the post-reform situation, that is under the new prices and given the new income, in order to be equally well off as before the reform, that is under the old prices, and given the old income. The equivalent variation welfare concept is the monetary compensation a household would have to forego in the baseline, that is under the old prices, and given the old income , in order to be indifferent between this baseline and the post-reform situation with new prices and new income

Export results

Clicking *Export* will create an Excel-file that contains all the tables presented by the Analysis tool, maintaining the same structure.