# The OECD Tax/Benefit Model

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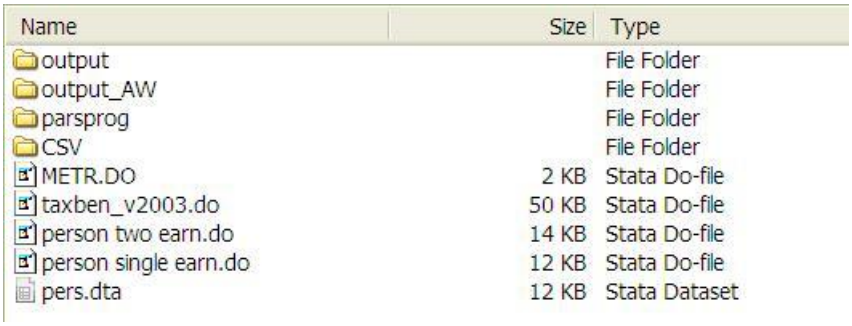
## 1. The architecture of the Model

The OECD Tax/Benefit model is composed of five parts:

- Part one is the main program, **taxben.do**. This is the program which executes first, generates the various menus, and creates the basic building blocks for each of the different types of model runs. It then calls the necessary parameter and program files.
- Part two are the 'person' files - **person_single_earn.do** and **person_two_earn.do**. These programs are called by the main taxben program, and set up the various family types and earnings levels, depending on which family type and model run was selected. All of the general assumptions which hold across all countries, such as the assumption that housing costs are 20% of AW, are created here.
- Part three is the parameter files. These files set parameters such as income limits, tax rates, and define most other constants. These files exist because, in most cases, the basic structure of a tax/benefit system does not change from year to year. However, things like tax bands or income thresholds generally change each year. Thus, in many cases it is possible to create a model for a country for a particular year simply by updating these parameter files. The parameter files follow the naming convention **XPARMY.DO** where X is the two letter country abbreviation and Y is the year being modelled.
- Part four is the program files. These files model the structure and implementation of the tax and benefit rules, using the specific parameters defined in the parameter files. For example, a program file would contain the code 'if income is above A, tax it at B percent'. A and B would be defined in the parameter file for the country. The program files follow the naming convention **XPROGY.DO** where X is the two letter country abbreviation and Y is the year being modelled.
- Finally, **METR.do** is the program which computes the Marginal Effective Tax Rates.

## 2. Installing the Model



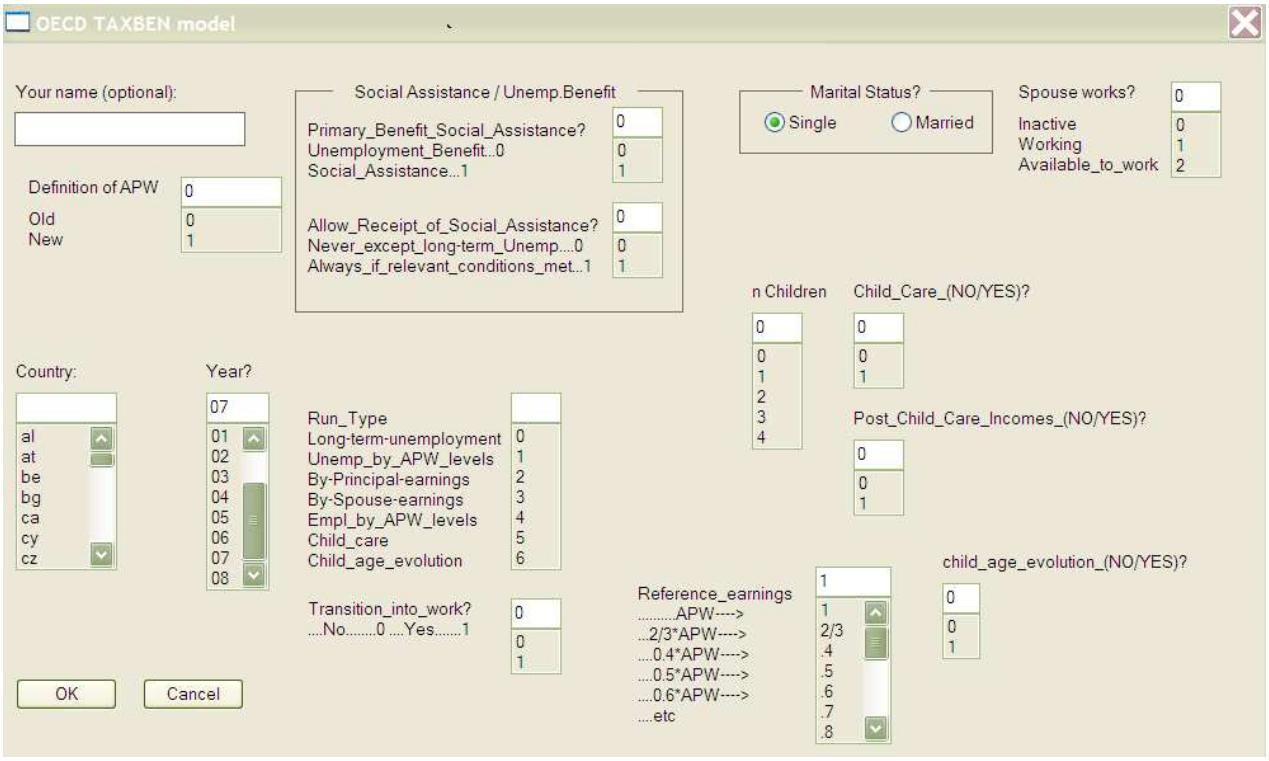
| Name | Size | Type |
|---|---|---|
| output | | File Folder |
| output_AW | | File Folder |
| parsprog | | File Folder |
| CSV | | File Folder |
| METR.DO | 2 KB | Stata Do-file |
| taxben_v2003.do | 50 KB | Stata Do-file |
| person two earn.do | 14 KB | Stata Do-file |
| person single earn.do | 12 KB | Stata Do-file |
| pers.dta | 12 KB | Stata Dataset |

In order to install the application, the five files and four directories above must exist. All of the **XPARMY.DO** and **XPROGY.DO** files must be located in the PARSPROG directory. Two CSV files **AW.csv** and **APW.csv** files must be located in the CSV directory. If you have downloaded the zip file, the directory structure above should be created when you unzip the files (be certain to instruct your unzip program to 'preserve directory structure' or 'use folder names'). Please note that it is necessary to set stata's current directory to the directory where taxben_v2003.do is located using the 'cd' command (e.g. 'cd c:\taxbenmodel'). Please note also that the program files are in the zip file ***OECD tax-benefit calculation models*** that is available on line www.oecd.org/els/social/workincentives .

## 3. Running a Model Interactively


It is first necessary to execute the program, typing 'do taxben_v2003' from the command line. After the program has been loaded into memory, typing 'start' will pull up the menu on the left. To run the tax/benefit model interactively, click the top option, 'Run with User Interface'.

The second menu (pictured below) allows the various options to be set. Note that only 'Your name' can be left blank if the model is to run successfully. Thus selection of a country and run type are imperative, even if everything else is to be left in its default setting.




## Explanation of Model Options

A - The Five Types of Model Run

The primary question to ask when running the model is what sort of model you wish to examine. The tax/benefit model has five basic model structures for which it can generate data. They are specified in the 'Run Type' box,and are as follows:

- Run Type Zero - Long Term Unemployment. This run type assumes full time unemployment with previous earnings set at 100% of AW, and runs the model for each month in unemployment (from the first month to the 60th month) to determine benefits received over time. This allows the user to see the expiration of duration-limited benefits such as Unemployment Insurance.
- Run Type One - Unemployment by AW Levels. This run type assumes unemployment (no working hours) and various the previous earnings levels between 0 and 200% of AW. In the case of a two earner couple (1), the secondary partner is assumed to work full time earning wages equal to 100% of AW.
- Run Type Two - By Principle Hours. This run type varies the number of hours worked per week by the primary partner between 0 and 80, holding the wage level steady at 100% of AW. In the case of a two earner couple(1), the secondary partner is assumed to work full time earning wages equal to 100% of AW.

- Run Type Three - By Spouse Hours. This run type varies the number of hours worked per week by the second partner between 0 and 80, holding the wage level steady at 100% of AW. In the case of a two earner couple(1), the primary partner is assumed to work full time earning wages equal to 100% of AW.
- Run Type Four - Employment by AW Levels. This run type assumes the primary is working full time (40 hours per week) but changes the wage level from 0 to 200% of AW.

(1) - A 'two earner couple' refers to a model run with the 'Marital Status' switch set to 'married' and the 'spouse works' switch set to one.

B - Social Assistance / Unemployment Benefit

Two switches exist for controlling the receipt of Social Assistance, or minimum income benefits. The first switch, 'Primary Benefit Social Assistance' determines whether the models are being run for someone eligible for unemployment or not. If the switch is set to '1', the person is assumed to be ineligible for any sort of unemployment benefit. If it is set to '0, they'are assumed to be eligible for Unemployment benefits.

The second switch, 'Allow Receipt of Social Assistance', determines whether income is evaluated for minimum income benefits. If this switch is set to '0', no social assistance will be received, even at very low income levels. If the switch is set to '1', social assistance benefits are calculated if income is below minimum thresholds.

C - Reference Earnings

This switch allows the wage level to be changed. By default, wages are set to 100% of AW for a full time worker. Thus, if someone works 20 hours per week, they will earn (gross) 50% of AW. however, this is not always the wage level one wishes to examine. Changing this number allows one to scale the wage level up or down. If, for example, one wanted to examine someone working full time, but earning the minimum wage level, and one knew that minimum wages were 41% of AW in a particular country, one could enter '0.41' in the reference earnings field, and full time wages (or previous wages, for calculation of unemployment benefits) would be equal to minimum wage. Note that this scaling factor applies to both workers in the case of a two earner couple.

D - Transition Into Work

In many countries, moving from a state of unemployment to a state of employment can result in special benefits being awarded. For example, a lump sum might be paid upon starting a new job (to cover the one-time costs often associated with a new job), or a benefit might be paid based to recipients of unemployment benefit who find a new job quickly, based on the amount of benefit they had remaining when the new job was found. The model uses this switch to pay these special benefits. Thus, if the 'Transition Into Work' switch is set to one, the model assumes the individual is moving from a state of unemployment to a state of employment. It is very important to set this

switch to '0' if you wish to look at the net income position of an individual in a steady state of employment or unemployment, or if you wish to examine the transition from employment to unemployment.

E - Child Care

At this time, the child care switches ('Child Care YES/NO' and 'Post Child Care Incomes') are not fully implemented in all cases. We do not recommend moving them from their default ('0')

## 5. Running the Model Using a Control File

The OECD tax/benefit model has several options which are not reflected in the interactive menu. Additional functionality can be accessed using a *control file*. Please note that a sample of control files is in the zip file ***OECD tax-benefit macros*** that is available on line www.oecd.org/els/social/workincentives .

The first line is a header line telling the program which variables will be set by the control file. Each additional line in the control file represents one model run, using the parameters set by that line. Although one assumes there is a limit to the number of model runs a control file can execute, we have successfully used a control file to execute more than 1500 model runs.

Options which may be set using the control file include:

**nRuns** - required - number of runs contained in the outfile.
**nConfig** - required - number of runs contained in the outfile.
**yr** - Tax/Benefit year to be modelled.
**ref_earn** - allows the scaling of earnings. Normally this variable is set to 1 (100% of AW), but occasionally one may want to change the scale of the earnings levels, for example, with two-earner couples.
**run_type** - as explained above, an integer between 0 and 4.
**intoWork** - determines whether the run will be for an individual moving into work.
**mars** - marriage status - 1 for married, 0 for single
**sp_works** - determines whether the second partner is working or not
**spouse_inc** - is the spouse the one earning income?
**principal_days** - number of days per week worked. 5 days per week is 40 hours, or full time employment.
**runcmnt** - Comments to be places in the outfile.
**outfile** - specifies a file name to which data will be written.
**country** - specifies the country
**outvar1** to **outvar30** - output variables to be written to *outfile*.

To use the control file **ctrl_data_ALL_01.xls** included in the distribution, convert the excel file to csv (comma separated values) and then use STATA's import function to convert the csv file to a stata dataset.

## 6. Troubleshooting

Occasionally, errors occur with the program. One of the most common occurs when the programs exit abnormally (because, for example, a variable has been referenced which does not exist). If this occurs, the first thing to check is the current directory (using the STATA command 'cd'). The program changes directory when it runs, and an abnormal exit may leave you in the wrong directory. If this is not the problem, exiting STATA and re-starting may solve the problem. We would like to emphasize that although we appreciate reports of any errors or bugs, we cannot offer support on these programs.

Please send all feedback to the Social Policy Division Contact with the subject "Tax Benefit Models".

## Annex 1. Excel Macros

Also included in the zip file ***OECD tax-benefit macros*** are the excel files used to create some of our output tables. To create the excel output tables, copy the output files created by the sample control file **ctrl_data_ALL_01.xls** to the same directory as the excel files, and then execute the macro 'aRunImport' contained in **Template_Macros.xls**.