Attanasio, Levell, Low and Sánchez-Marcos (2018) "*Aggregating Elasticities: Intensive and Extensive Margins of Women's Labour Supply*"

(1) Folder BenchmarkEconomy

/Code/Main

1. We use Fortran 90 to solve and simulate our model economy. We also compute several moments to compare to the data. Some additional moments are computed from the simulated data using Stata.

2. The code is split into modules which are called as necessary from the main program, which is in the file intensive1.f90. The code is written to run on a parallel computer system using MPI.

3. The different modules are:
    i. intensive1.f90 [main program]
    ii. calibrate.f90 [reads several inputs (see 4)]
    iii. partner.f90 [implements the backwards solution method of the dynamic problem]
    iv. params.f90 [for reading in the parameter values, defining grid sizes, and defining utility functions etc]
    v. assetgrid.f90 [defines the grid over assets that is used in the solution]
    vi. wageproc.f90 [introduces wage growth, define grid for years of experience (if needed)]
    vii. equations.f90 [defines conditional value functions]
    viii. reservat.f90 [find the reservation assets value of the participation decision]
    ix. consolve.f90 [simulates consumption given the solution that has been previously found]
    x. bisection.f90 [simple routine to solve for fixed point in one dimension]
    xi. subrout.f90 [for passing information between routines]
    xii. simulate.f90 [simulates behaviour once the model has been solved]
    xiii. statistics.f90 [computes several statistics from simulated data]
    xiv. banner.f90 [for outputting parameter values used]

4. The inputs to the code are: the parameters and targets [**mpiparams.inp, mpiguess.inp, targets.inp**], random numbers [**randnos.inp, randnosupdate.inp**,] and the wage grid and associated Markow transitions [**wagepoints1812p_mQh.inp, wagepoints1812p_fQh.inp, transwagepoints1812pQh.inp**]

5. Output from the simulations is in ASCII text files. Output can either be in averages (which go to **sims''.out**) or on individual behaviour (which go to **sample''.out**). The latter is explored with Stata as indicated below.

6. There are 3 loops within file calibrate.f90 that have to be adapted for the different counterfactuals

    a. Benchmark [set loop **j_grid**=1,1] [for loop **j_grid2** set ingrid2=1, ngrid2 =1] [for **j_frisch** set startfrisch=0, endfrisch=0].
    Output files: sims000.out, sample0000.out

    b. Frisch in the Benchmark [set loop **j_grid**=13,136] [for loop **j_grid2** set ingrid2=4, ngrid2 =4] [for loop **j_frisch** set startfrisch= j_grid, endfrisch= j_grid].
    Output files: sims't'40.out, sample't'40.out, t=13,136.

    c. Frisch in the Recession

        i. Simulate a Recession at each age [set loop **j_grid**=13,136,4] [for loop **j_grid2** set ingrid2=1, ngrid2 =1] [for loop **j_frisch** set startfrisch=0, endfrisch=0] and set Icycle=1 in mpiparams.inp.
        Output files: sims't'1.out, sample't'a.out, t=25,55.

        ii. Simulate the counterfactuals to calculate the Frisch elasticity at each age in the Recession [set loop **j_grid=**13,136] [for loop **j_grid2** set ingrid2=4, ngrid2 =4] [for loop **j_frisch** set startfrisch= j_grid, endfrisch= j_grid] and set Icycle=1 in mpiparams.inp.
        Output files: sims't''q'41.out, sample't''q'41.out, t=25,55, q=1,4.

/Code/MarshallianHicksian

For the Marshallian:

i. Set loop **ihicks**=0,0 in calibrate.f90
ii. In mpiparams.inp set [0.1d0 !marsvarwage;
0.d0 !lump: lump sum transfer to calculate hicksian]

Output files: sims000m.out, sample0000m.out

For the Hicksian equal compensation:

1. Set loop **ihicks**=1,1 in calibrate.f90
2. In mpiparams.inp set [0.1d0 !marsvarwage;
-595.d0 !lump: lump sum transfer to calculate hicksian]

Output files: sims0001.out, sample0001.out

For the Hicksian with heterogeneous compensation by initial wage:

1. Set loop **ihicks**=1,1 in calibrate.f90
2. In mpiparams.inp set [0.1d0 !marsvarwage;

-96.d0/-266.d0/-520.d0/-1238.d0 !lump: lump sum transfer to calculate hicksian]

Output files: sims000'c'.out, sample000'c'.out, c=1,4 (for each level of compensation)

/StataFiles

This folder contains stata files to read simulated data and to produce statistics based on the output files above. The do files are specific to the type of counterfactuals.

/Benchmark

a. read.do [read simulated data]
b. baselineSHORT.do [produces statistics and figures of the benchmark economy, reported in Tables 5 and 6 and Figure 2 in the paper]
c. lumpsum.do [calculates lumpsum transfer to compute Hicksian elasticity]

/Frisch in the Benchmark [ft.do, reported in Tables 8 and 9 in the paper]

/Frish in the Recession [ft.do and table.do, reported in Tables 10 in the paper]

/Marshallian [elast.do, elasthetero.do, reported in Tables 11 in the paper]

/Hicksian [elast-h.do, elast-h-hetero.do, reported in Tables 11 in the paper]

(2) Folder ReturnsExperienceEconomy

a. The inputs to solve the economy with returns to experience that we report in the Appendix [same as in the Benchamark, but using files **mpiparams.inp, mpiguess.inp** in this folder]
b. The code to be used is the same as in the Benchmark Economy.
c. The stata files that have to be used to produce statistics in Tables 22, 23, 24 and 25 and Figure 4 in the paper are the same than in the Benchmark