An Equilibrium Model of the African HIV/AIDS Epidemic

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Replication files - readme

This file describes how to run all the computation files for the paper. There are two sections in this document: the first describes how to generate the statistics from the data and the second describes how to run the quantitative model.

Empirics

The code for the empirical part was written in Stata. The data mostly comes from the DHS program and can be readily downloaded from their website.[1] The exact variables that are used in all of the empirical analysis are described in detail in Appendix B of the paper. All files relevant to the empirical part are contained in the folder empirics_stata.

The moments used as targets in the model calibration (Table III) are computed by running the file moments2004.do. This file also computes the lifecycle statistics needed to plot the figures in Appendix E (Figures 6, 7, 8 and 9).

The cross-country regressions with respect to circumcision (Table IV) are run using the file circ_regs.do. This file uses the data available in cross_country.dta (the sources are again described in Appendix B).

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[1]The DHS program website is dhsprogram.com/data. The data is available for free, but registration is required to download it.

The data from UNAIDS and the World Development Indicators for Figure 1a is compiled in the file data_fig1a.xlsx.

The file subj_HIV_reduction.do computes the HIV awareness measures in Figure 4 for all years.

The file moments96.do computes the statistics for 1996 that are reported in Tables X and XI (the corresponding statistics for 2004 in these tables are computed in moments2004.do, as described above).

Quantitative Model

As described in Appendix G, the code for the quantitative model is programmed in two parts: one in MATLAB and the other in FORTRAN. The MATLAB code calls an executable (programmed in FORTRAN) to run the value function iteration.

The first step is to compile the FORTRAN files (.f and .f90 files) into an executable called aids.exe (aids) in Windows (Unix-based) machines. This executable will be called by the MATLAB code. In order to run one instance of the code, run the file mainp.m in MATLAB. If you want to run the entire estimation of parameters that uses the Pattern Search algorithm, run estimation.m.

In order to run the code, parameter values and some control variables need to be set. These variables are set in the list of variables in the file parameters_all.txt.[2] This contains values for 80 different variables. These variables are listed and described in the file model_inputoutput.xls. By choosing different values for these variables, according to the values supplied in the text, all results from the paper can be derived.

After the model is computed, the main statistics are written in the file exceloutput.txt. The order of the statistics are given in the file model_inputoutput.txt.

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[2]If you run one of the non-equilibrium experiments (epidemiological or small-field), two parameter files must be set. The file parameters_all.txt should list the benchmark values for the different parameters. Then, parameters_exp.txt should be a "copy" of parameters_all.txt with the exception of the desired parameter that one wants to change in the experiment.

Additional statistics are reported in different files: moments by circumcision types are saved in moments_bycirc.csv; life cycle moments are saved in lifecycle_moments.csv and hiv_deaths_byage.csv; the results from the experiments are saved in exceloutput_epid.txt and exceloutput_smallexp.txt (for the epidemiological and small-field experiment respectively).