Program Guide: Growth and Convergence

Dick Startz

Spring 2017

This guide documents programs used in “Growth and Convergence.”

1. The underlying data is the Penn World Table 9.0 as corrected on August 16, 2016. The sources are the Stata 14 file given at <http://www.rug.nl/research/ggdc/data/pwt/v90/pwt90.dta> and the Excel file given at <http://www.rug.nl/research/ggdc/data/pwt/pwt-9.0>. Note that this version uses 2011 dollars.
2. The EViews program convert9toEViews.prg reads in the Stata file, converts it to EViews, and generates per capita real GDP according to several definitions. It also generates separate U.S. per capita real GDP series and then creates GAP variables which are . (Note that this is really the ratio, not the gap of the ratio from 1.0.) The program also creates a separate pages for several countries. The file is saved to PWT90.wf1.
3. The EViews program runMarkovSwitching.prg reads in PWT90.wf1 and runs Markov switching models for Korea and Spain using the three definitions of the gap. This is a diagnostic program not directly used in the paper. It shows that unrestricted mle Markov-switching for a single country gives the smoothest results using the “NA” GDP series.
4. The EViews program createMLE3Probs.prg reads in PWT90.wf1 and runs Markov switching models for Korea and Spain and saves the smoothed probabilities of convergence to the files koreaProbs.xls and spainProbs.xls. These files are then manually resaved as koreaProbs.xlsx and spainProbs.xlsx to get around some kind of security issue.
5. The program createPWT90MatlabDataNoPetro.m reads in pwt90.xlsx and saves the Matlab file PWT90Data.mat. Essentially, two things are done. (1) The US data is pulled out separately. (2) The data is organized in long, multi-country series. The series firstObForCountry and lastObForCountry give the index in the series showing where a given country’s data begins and ends. The key variables are y and yStar, gap=log(y/yStar) as well as pop. The latter is used for making summaries that include population weightings. We also capture some useful numbers such as the last observed population for each country.
6. summarizeData.m reads in PWT90Data.mat and produces summaries of the data.
7. weightedMean.m is a utility function to give the weighted mean of the first variable according to the relative weights using the second variable.
8. runGibbsFrontier.m does a Bayesian estimate of the random walk for the frontier. All the real work is done in gibbsFrontier.m. Results are saved in gibbsFrontier.mat.
9. estimateBayesianConvergence3States.m runs the overall Bayesian estimation. The results are saved in bayesianConvergenceEstimates3States.mat. It uses the subprogram allCountrySwitchingSampler.m which does all the real work.
10. allCountrySwitchingSamplerBothProb3StatesWeighted.m actually executes the Bayesian estimation. It uses the subprogams:
    1. carterKohnAR1Restricted.m which does a multi-move state draw for every country, but which I wrote. “Restricted refers to not picking a diverging state for countries with positive gap.
    2. drawh.m draws the precision for every country.
    3. drawSingleParamUPriorAllCountriesWeighted.m draws rho in common for all countries.
       1. truncateDraw.m which does a truncated normal draw.
    4. drawTransProbAllCountries3StatesWeighted.m draws the transition probabilities in common for all countries.
11. quickEstimationCheck.m displays some graphs as a quick check that bayesianConvergenceEstimates3States.mat makes sense. The results are not used in the final paper.
12. graphKoreaAndSpain.m graphs the mle and Bayesian estimates for Korea and Spain, all the real work being done in graphGapAndProbForCountries.m, which in turn calls graphGapAndProb.m. The mle estimates are found in koreaProbs.xlsx and spainProbs.xlsx.
13. summarize3StatePriorAndPosterior.m does just that.
14. Generate3StateFutureSimulations.m does just that. Results are saved in simulatedFuturesFrom2014.mat.
15. reportOn3StateFutureSimulations.m reads in simulated3State FuturesFrom2014.mat and creates statistics and figures for paper.
16. reportOnWhichCountriesMatter.m reads in simulatedFuturesFrom2014.mat and reports on how much each country contributes to overall world convergence.
17. All programs are copied into the folder Version 9 No Petro. The program createPWT90MatlabDataNoPetro.m works as in item 5 above, except that it also eliminates Qatar, Macao, Brunei, UAE, Kuwait.
18. The same programs as above are then run except in the Version 9 No Petro folder.
19. Programs are copied from folder Version 9 into folder Version 9 Both Probs. allCountrySwitchingSampler.m is changed to allCountrySwitchingSamplerBothProbs.m to allow estimation of . estimateBayesianConvergence.m is changed to estimateBayesianConvergenceBothProbs.m to call allCountrySwitchingSamplerBothProbs and to have the same prior for and . summarizePriorAndPosterior.m is augmented to report on .
20. The same programs as above are then run except in the Version 9 Both Probs folder.
21. graphChina.m graphs state and gap just for China.