Macroeconomic theory IV – ECO 6120
First homework on growth regressions

Download the excel file of the Penn World Table version 9 at:
http://www.rug.nl/ggdc/productivity/pwt/

Use the data on RGDPE (GDP PPP adjusted) and POP (population) to compute per capita GDP and perform growth regressions for the first part of the empirical analysis.

Always explain what you are doing from the point of view of economic theory. Explain the underlying theoretical framework of the regressions (for absolute and conditional convergence). For all regressions, use Pooled least squares with time dummies and Cross-section weights (PCSE) standard errors using Eviews.

1: Pick-up randomly between 20 and 25 OECD countries including USA for which the data are available since at least 1960. Using pool time series cross section data (period of 10 years), test the hypothesis of absolute convergence in the 1960-2010 (using the 1950 data for the lag per capita GDP). Provide a sigma-convergence analysis. Analyse and discuss.

2: Pick-up randomly between 40 and 45 non-OECD (less-developed countries) for which the data are available at least since the 1970 and organize a new panel with the less-developed countries and the OECD countries (all country panel). Using pool time series cross section data (period of 10 years), test the hypothesis of absolute convergence in the 1970-2010 period (using data from 1960 for the lag per capita GDP, for some countries the first available data is 1970). Provide a sigma-convergence analysis. Analyse from the point of view of economic growth theory and discuss.

3: In the same sample than for 2, test the hypothesis of conditional convergence using country fixed effects. Compute the annual speed of convergence, analyse and discuss. Compare results with 2.

4: Eliminate time dummies and country fixed effects and estimate the model with a separate constant for each country (similar to country fixed effects) after having transformed all variables as deviations from the cross sectional sample mean (this is equivalent to introducing time dummies). Estimate the simple conditional convergence model

\[ D_y = -\beta y_{it-1} + \gamma + \epsilon_{it} \]

where \( y_{it} = \log \left( \frac{Y_{it}}{\bar{Y}_t} \right) \) and \( \bar{Y}_t \) is the mean of \( Y_{it} \) across the \( i \) at time \( t \).

Compute the long-run estimated level of disparities for each country. Are they significantly different from zero? Produce a Table illustrating the estimated long-run level of disparities (together with their p value).

5: Repeat exercise 3 by eliminating the country fixed effects and by adding variables that would control for the countries’ steady states. Select the straightforward variables that come out of the prediction of the Solow model.
6. Following what you have done in 5, experiment with other variables that could be used as controls for countries’ steady states. Some variable can be founded in the PWT 9 but other can be downloaded from the web. Explain why the variable could be used as a control for the steady state. Analyze and discuss.

7. Repeat 6 with the sample of developed countries only.

8. How do you reconcile the results from the regressions in 1 to 7? Analyse and discuss along the line of absolute or conditional convergence.

Maximum number of pages in the empirical report: 15. Put all estimated outputs from Eviews (or do files from Stata) in an Appendix (not counted in the 15 pages).

To be given at the department of economics (or during my office hours) no later than Thursday May 18 at 3:30 PM 2017 at my office. One report by a team of two students.