Testing for Output Convergence: A Re-Examination

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Summary

The neoclassical and endogenous growth models have different predictions of national output dynamics. A strong result from the standard neoclassical growth model is the convergence of per capita output across countries with similar characteristics. It means that differences in national output, in per capita terms, are going to disappear over time. The endogenous growth model, on the other hand, asserts that country-specific factors play a role in determining aggregate income. Since country-specific factors can evolve endogenously according to the environment unique to a country, countries with dissimilar initial endowments and attributes can have per capita output that do not converge over time. The different views on national output have spurred considerable interest in testing whether the observed per capita output data are converging or not.

In this study, we use recently developed statistical techniques to investigate the convergence property of national output. Data from the G7 countries are used. The stationarity property of the real per capita output relative to the U.S. is used to infer convergence. Our empirical results suggest that the inference about output convergence can be dictated by the choice of a null hypothesis. A conclusion of no output convergence can be reached just because no convergence is considered as the null hypothesis.

Further, the no-convergence result reported in previous studies pursuing the time-series definition may be attributed to the low power of the test procedures being used. While short output data series or the use of univariate unit root procedures yields very limited support for the convergence hypothesis, the combination of long sample and efficient panel procedures delivers a more favorable result for the same hypothesis.

In addition to the issue of output convergence, the empirical exercise raises a few interesting observations. For example, the results from a typical panel unit root or stationarity test have to be interpreted with caution. A non-rejection of a joint non-stationarity (stationarity) null hypothesis is not a sine qua non for all the series to be non-stationary (stationary). Similarly, the stationarity (non-stationarity) of a subset of
series can lead to the rejection of a joint non-stationarity (stationarity) null hypothesis. Specific panel procedures have to be implemented to determine the stationarity property of individual series.

Another issue is related to the presence of convergence clubs. In the two data samples examined, there are signs that countries have diverse convergence patterns. Even among the G7 nations that are quite homogenous the convergence in output does not occur simultaneously across all the countries. The result lends considerable support to the notion of convergence clubs in which member countries converge to a club-specific steady state. Thus, empirical studies of output convergence should allow for the presence of convergence clubs.