

Midterm Paper: Are Solow's Estimates Robust?

References:

Solow, Robert. 1957. "Technical change and the aggregate production function." *Review of Economics and Statistics*, Vol. 39:3, pp. 312-320. [<http://www.jstor.org/stable/1926047>]

Organization of Economic Cooperation and Development. 1998. *International Sectoral Database*. Paris, France: OECD.

Data: isdb_usa.csv, isdb_aust.csv, etc...

In this paper, you will be testing to see how robust Solow's estimates for the MPK and the MPL. To do this, you will use Solow's econometric specification (i.e., his specification of the population regression function – equation **4d** on page 318) and apply it to a couple of different samples. You will also need to estimate a multiple regression version of the Solow theory for each country (where constant returns to scale are not imposed). You are to do this for 2 countries (USA and an additional OECD country of your choosing). You will find these on the k drive, under the ISDB folder.

*NOTE: you will simply run regressions with your two SAS datasets (one for each country). Since you will be investigating the residual term, you will want to output a new file that saves both the predicted Qs and the residuals.

Follow this outline:

I. Introduction

Briefly discuss the importance of growth (why do we care?) and explain the importance (ramifications) of Solow's 1957 estimates of the MPK and the MPL. In other words, what would it matter if a country had different parameter estimates?

II. Solow Revisited (Theory)

- A. Starting from Solow's aggregate production function model (Cobb-Douglas production function), DERIVE the theoretical equation that will be estimated. Be sure that you rigorously DEFINE your notation; pretend that at least some of your readers will have never read (or not lately) the Solow paper, so you have to show "just enough" to bring us up to speed, so that we understand what it is you are testing.
- B. Be sure to highlight and discuss the key assumptions, and of course, their ramifications.

III. Econometric Results

- A. Define and discuss the data (samples periods, etc...); you may wish to include some summary statistics to compare and contrast your two countries
- B. Report the SRF (Sample Regression Functions) for each sample you used.
- C. Hypothesis Testing:
 - (1) You should not only test the traditional null, $H_0 : \beta = 0$, but you should be able to test to see if your marginal product of K and L are significantly different from Solow's

estimates (see Table 2, page 319). For simplicity, you can test to see if the marginal product of capital (MPK) = .3 and if the MPL = .7.

(2) You should also “do” the F test to see if the regression as a whole is significant

IV. Analysis of Residuals

Investigate the residual term for each SRF. You might wish to plot the stored residuals against the DATE to see how ‘technical change’ has moved over time in each country. This can tell us a great deal about periods of economic growth or recessions. Discuss these.

V. Conclusion

VI. Appendix

NOTE: rather than putting the “work” for all the tests (F-test, t-tests) in the body of the paper, please create an APPEDIX and put that information there. You can then simply state the hypothesis, test results and inferences in the body, while referring the reader to the APPENDIX for the details of each test.

VII. References

This should obviously include Solow’s paper and the data source.