SOLOW ON EXOGENOUS AND ENDOGENOUS GROWTH,
AND THE SWAN PROPOSITION

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Abstract

In this brief note, we will review some of the ideas on exogenous and endogenous growth put forward by Solow in his <u>Siena Lectures</u>. On the one hand, a theory of endogenous growth would like to do with fewer exogenous parameters than the old, and this can be done only by broadening the scope of the theory itself, by providing an explanation of some phenomena that were in earlier theory left unexplained. The usual outcome of this process is that some parameters become variables, hence new interconnections arise. On the other hand, these new interconnections should manifest themselves in new properties of the steady state rate of growth: it should be greater than the natural rate of growth, and it should not be independent on the saving ratio. This seems to be Solow's conception of endogenous growth theory.

In the paper, we then review Solow's treatment of increasing returns to scale as a possible source of growth at more than the natural rate, and the associated proposition by Swan about the general class of production function which are compatible with steady state growth. Although originating from the early sixties of the last century, this is a proposition of great generality that answers at once to the two questions of (i) what sort of technical progress is compatible with a steady state, and (ii) how the function is to be parametrized to allow for increasing or decreasing returns to scale, if there is to be a steady state.

We then proceed to discuss some suggestions by Solow as to how to achieve endogenous growth. In particular, we pursue his suggestion as to how to endogenize technical progress in an economically interesting way, i.e., allowing for "learning by doing" *à la* Arrow. We show that the resulting Arrow-Solow production function, although not belonging to the Swan class, exhaustive as the latter was meant and held to be, is still compatible with a steady state growth which is uniquely determined. Finally, we suggest a way of looking at exhogenous growth compatible with our findings.

Subjects indicated in the <u>Call for papers</u> dealt with or touched upon in our note:

-Key elements necessary to generate growth models and how
they differ across time;
- Mechanisms of endogeneity of growth and technical change;
- The relations between the "new" and "old" growth theories;
- Aspects of growth theory developed in the past, possibly with
reference to modern approaches;
Main assumptions in growth models, and their relevance to
sustained growth;