

a cause, of technological progress .

5.1 Moving Out of the Steady State

Zilibotti¹² argues that the main feature which distinguishes endogenous growth from traditional neoclassical models is the existence of an autonomous engine of growth. In the Solow framework, long-run growth is not sustainable in the presence of a fixed supply of some non-reproducible factors which enter the production function, because the marginal productivity of the reproducible factor would fall to zero as the accumulation proceeds. The convexity of technology is not sufficient to generate the traditional result of a long-run stationary equilibrium trajectory.

On the other hand, modern growth theory has examined a number of economic mechanisms which might sustain the marginal productivity of capital, as accumulation proceeds. Among these already mentioned are learning-by-doing externalities (Romer), accumulation of human capital (Lucas), intentional innovation and financial development. If the basic model is adjusted at lower levels of accumulation so that technical progress only augments the reproducible factors, it is possible to obtain an analytical framework which fits Rostow's classic description of take-off and development for certain types of economies.

One of the problems of the standard convergence, non-convergence analysis is that Rostow's underdevelopment traps, where some economies never move forward into the growth phase at a particular take-off period, are more difficult to explain. Perhaps some synthesis of Solow growth in the steady state along with Romer's endogenous self-sustained growth might be possible to explain these Rostovian "leaps", that is, moving from one steady state path to another (take-off) through the process of endogenous growth.

5.2 Synthesis and Diffusion of Technology

In some ways, of course, Romer's and others' work was not quite as new as they might have seemed. Even as far back as the 1960s, there had been attempts to develop models in which technological progress had been endogenized. Basically, there were two different ideas that were developed in this (earlier) literature, one that emphasized learning (a positive externality of other economic activities),

¹² Fabrizio Zilibotti, "A Rostovian Model of Endogenous Growth and Underdevelopment Traps", *European Economic Review*, 39 (1995).