

● "New Growth Theory"

The new growth theory begins by incorporating the ingredients that are so far missing in our formal analysis of the patent term. Traditional growth theory did recognize the importance of technical change and innovation as a contributing factor to economic growth, but innovation was not central to the analysis and the dynamics of growth in the economy. The new growth theory accords innovation and the resulting beneficial spillovers a central role in the dynamics of economic growth. Innovations are the motor of economic growth. R&D are key inputs to the most dynamic sectors of the economy such as robotics, pharmaceuticals, telecommunications, and even traditional sectors such as automobiles.

Each firm can accumulate knowledge, just as it can accumulate capital. The more knowledge it accumulates, the greater is its output. Each firm's own knowledge is like a type of capital. Savings are devoted both to the accumulation of physical capital and to the accumulation of knowledge. But knowledge, like physical capital and labour, is subject to diminishing returns. So profit maximizing firms choose that level of 'knowledge' to employ which equates marginal product of knowledge to its marginal cost.

Economy-wide, or aggregate, knowledge is the sum of what every firm and worker knows. The output of each firm depends on this aggregate stock of knowledge. Simply because there are other knowledgeable firms and workers around, an individual firm can produce more.⁶¹

When a firm decides how much knowledge to accumulate, it evaluates the effects of its decision on its own profits. It does not take account of the fact that its own accumulation of knowledge will bring benefits to other firms. Economy-wide knowledge is an **externality**, a cost or benefit experienced by one economic agent that results from the actions of another agent or agents. Because economy-wide knowledge is an externality, when one firm invests resources in advancing its own knowledge, it is at the same time expanding the production possibilities of all the other firms in the economy as well. As a result, for the whole economy there are **increasing returns** to knowledge. Increasing returns occur when the marginal product of 'knowledge' increases as the quantity of 'knowledge' increases, other inputs held constant.

⁶¹ Paul M. Romer, "Endogenous Technological Change", *Journal of Political Economy*, 98, 1990: S71-S102.