

in consumer goods markets. How does this occur? It has been hypothesized that there are knowledge externalities in research and development. In other words, one good idea begets another, which begets a third and so on. There may also exist increasing returns to scale in production, not decreasing or constant returns to scale as is usually assumed. Thus, a large global manufacturer such as Korea's Samsung may be able to become more productive the larger it becomes as it branches out into the development and marketing of new products. In addition, the market structure that firms operate in is also important. A non-competitive market or effective protection of intellectual property rights may allow the firm to capture economic rents from the development of its products, thus increasing the potential rewards of R&D. These are the variables that endogenous growth theory attempts to include. In a nutshell, endogenous growth theory is based on the assumption that long-run growth is based on economic incentives provided by the economic environment within which economic actors work.

Romer, in his pioneering article, presented a theoretical argument that, even with a constant state of technology and population, growth in per capita incomes can increase, and may even increase without an upper bound.<sup>10</sup> He accomplishes this by dropping the diminishing returns assumption in the neoclassical growth model. Thus, the rate of technological change becomes endogenized in his model, and not exogenous as in the traditional growth theory model. This is owing to the hypothesis that investment in knowledge will have increasing returns to scale. In addition, increasing the stock of knowledge creates a public good whereby positive externalities are derived. For example, investment in R&D will result in firm-specific knowledge that is used to develop a certain product, but it also increases the stock of such knowledge, thus increasing the possibilities for development of new products.<sup>11</sup> Opening an economy to international trade may also have positive growth implications, increasing the transfer of knowledge and the positive externalities that it produces.

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<sup>10</sup>Paul M. Romer, "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, Vol. 94, No. 5 (October 1986), 1002-37. For a good summary of endogenous growth theory, see Gene M. Grossman and Elhanan Helpman, *Innovation and Growth in the Global Economy*, Cambridge, Mass.: The MIT Press, 1991.

<sup>11</sup>See Grossman and Helpman, *op. cit.*, p. 335.