

To the extent imitators can come up with knock-off versions of the patented invention, the exclusivity of the inventor's property rights to appropriate rents is eroded. In industries where exclusivity of a patent grant cannot be enforced, the diffusion of new knowledge takes place, but at the cost of diminished incentives for doing R&D.

Over the period during which a patent permits excludability, consumers of the new product will pay higher prices and competitors will not be able to use new knowledge. That is, over its life a patent limits the short-term price benefits to consumers and the diffusion of new knowledge. Once the patent expires, the benefits of the innovation are transferred from the original innovator to consumers and competitors. After the patent has expired, society enjoys the fuller benefits of the innovation: lower prices, better product quality and variety.

II.1 THEORY OF THE OPTIMAL PATENT TERM IN A NON-TRADING ECONOMY

In the theoretical scenario of a non-trading economy, product and input markets are assumed to be perfectly competitive. Models, however, differ in what they assume about rents that a patentee can capture. In a competitive innovation industry characterized by a large number of firms competing to be the first to get the patent, the potential rent associated with the patent will be largely dissipated.¹³ The amount of rents that can be appropriated depends on a number of factors, such as: (a) the nature of competition before the patent grant in the invention industry;¹⁴ (b) whether the patent right provides effective exclusivity in the innovation product or process market; and (c) the size of the innovation.

To begin with, the amount of profits that a patentee can capture depends on the size of the innovation. A *major* innovation, also called a *drastic* innovation, causes the price of the product to fall significantly below the pre-innovation price. Major innovations result in large appropriable rents. The HDTV project is an example of a major innovation.

¹³ See, Yoram Barzel, "Patents, Property Rights and Social Welfare: Search for a Restricted Optimum", *Southern Economic Journal*, 43, October 1976: 1045-1055; George J. Stigler, *The Organization of Industry*. Homewood, Ill.: Irwin, 1968; Glenn C. Lourey, "Market Structure and Innovation", *Quarterly Journal of Economics*, 93, 1979: 359-410; and Donald M. McFetridge and M. Rafiquzzman, "The Scope and Duration of the Patent Right and the Nature of Research Rivalry" in John Pappalardo (ed.), *Research in Law and Economics: The Economics of Patents and Copyrights*, Volume 8, Greenwich, CT: JAI Press, 1986: 91-129.

¹⁴ The nature of product market competition after the patent has expired will also determine whether the reputation effect that the patentee has been an innovator enables it to make above-normal profits.