II.3. THE THEORY OF OPTIMAL PATENT TERM IN A TRADING ECONOMY

> By employing improved machinery, the cost of production of commodities is reduced, and, consequently, you can afford to sell them in foreign markets at a cheaper price.
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> -David Ricardo in *Principles of Political Economy.*

Patent protection in an international context is different for product and process innovations. For product innovations, patent protection can occur at the point of consumption if imitators can be prevented from selling unauthorized patented products. Thus, the ability of the patentee firm to enforce its right in the importing country is crucial to whether the foreign owner of patented innovation can appropriate the rents in the domestic market. In the case of process innovations, however, the enforcement of patent protection at the consumption end is less effective, since the origin of products manufactured by such a process can be easily disguised. In this case, effective patent protection requires protection at the production end rather than at the consumption end. This distinction is important if different patent rules apply in different countries, or if the rules are enforced differently.

To bring out the space and time dimension of the patent system in an international economy, let us begin by analyzing an extreme situation. Consider a single, large and high-income market such as the U.S., where patent rights exist. The monopoly pricing will induce a certain level of R&D. But the situation is suboptimal in two ways. Consumers' choices are restricted by monopoly pricing and the innovators fail to earn profits equal to the entire benefit to society[43] that is generated by their innovations. These two aspects of suboptimality give rise to both the benefit and the cost of extending patent protection to a larger, or an additional, market.

Consider Canada as the additional market that has not previously granted patent protection to U.S. innovators. The U.S. R&D firms gain additional monopoly profits by selling in Canada. On account of these higher returns, the U.S. firms increase R&D done in the U.S. U.S. welfare will improve beyond its previously suboptimal level. There will be benefits and costs in Canada. Canadian consumers gain access to new products. If the

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[43] In terms of Figure 1 above, the consumers' surplus (given by the area below the demand curve and above the P_0A line) is not appropriated by the innovator.