

Overview of Innovation

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ECONOMIC THEORIES OF INNOVATION

For this report, an “innovation” is any product or product modification that substantially improves the quality or decreases the cost of a product, while introducing a technology, material, or concept not previously found in any similar product on the market. Although this definition includes process innovations (changes in the means of production), this case study is most concerned with product innovations (changes in the final product), especially those that introduce a new concept into wheelchair design.

A primary tenet of macroeconomics holds that individuals and firms act to maximize their own utility (satisfaction) or profit. Firms make products for which they expect to receive financial rewards. Although theorists agree on this general goal, they disagree as to its effect on innovation. They also disagree with the commonly held belief that perfectly competitive firms must innovate to remain competitive. This latter belief mixes the economic idea of perfect competition with the everyday meaning of “competition.” By definition in economic theory, perfectly competitive firms have no reason to innovate because products are not differentiated and because the same technologies for production are available to all firms.

In 1915, Taussig proposed that innovations result from attempts to fulfill an expressed demand with the expected reward of profit. Hicks recognized that once the product exists, the incentive must change from reaping profit to reaping continued and increasing profits. In 1932, he proposed that the task of innovation is to decrease the cost of production, hence increasing the amount of profit (10).

Schumpeter characterized the role of large corporations with considerable market power and with large research laboratories as the source of innovation of the day. Many economists using static economic theories would predict that indus-

tries with a large number of small firms would encourage innovation. By emphasizing the role of large firms, Schumpeter explicitly remarked that such fragmented industries with many small firms would not innovate for two reasons: First, in such a structure, firms find it difficult to get necessarily high profits because imitations would be almost immediate, thereby eliminating excess profits and destroying the incentive to innovate.

Second, firms in this structure would not have the size to support the requisite industrial research laboratories. Some readers of Schumpeter are under the impression that he advocated monopoly as the source of innovation. Rather, he viewed large firms, whether or not they were in industries with single dominating firms (monopolies), as rivals competing to fulfill expressed consumer demands with the expectation of profits (21). Galbraith agreed, noting that for firms that do not compete on price, innovation offers an alternative means of increasing market share and profits (10). Empirically, Kamien and Schwartz found that in general industries with intermediate degrees of competition have had more innovations than those at the extremes, although there are certain industries on either side that show high degrees of innovativeness (10).

As mentioned earlier, the wheelchair market seems to fit the intermediate category b, having a few large firms that have a very large market share and several smaller firms. The two largest wheelchair manufacturers, Everest & Jennings, Inc. (E&J) and Invacare Corp., control approximately 70 percent of the market in dollar sales, but about 50 other firms are also listed in the ABLEDATA System as wheelchair manufacturers. The industry also seems to fit into the intermediate range because, as economists would predict, buyers recognize the large companies' brand names more readily than small companies' names and are willing to trust a name they recognize and know to be established.

MANAGEMENT AND GOVERNMENT PERSPECTIVES

Innovation is a costly and risky process, especially for small firms. Several of the manufacturers interviewed for this study (see ch. 5) cited the high cost of innovation as the largest impediment to the introduction of new products. While the Federal Government could encourage innovation through contracts or favorable tax treatment, the efficiency of these approaches requires careful study. In aggregate, expenditures by industry for all types of health R&D are substantial. In 1982, industry spent \$3.4 billion and the Federal Government spent \$5.0 billion (38).

Since industry spent such a large sum, this finding might suggest that Government support of industry R&D is not necessary. However, there are times when Government funding is appropriate. The wheelchair market is small and diverse. R&D efforts by industry focus on active users, the most lucrative segment of the market. Government funding might be useful in areas that would complement existing research, such as the large, general-purpose manual wheelchair market and the market for certain specialized rehabilitative wheelchairs. The manual wheelchair may be neglected because there are strict price limitations by third-party payers making it difficult for suppliers to charge a premium for added quality. The specialized rehabilitative wheelchair may be neglected because development costs are too high and the potential market is too small. For both types of wheelchairs, however, added features may be worth the costs.

It may also be useful to target Government funding toward the areas where the results are not

patentable (e. g., a new use for an existing material). Such subsidy could be awarded directly as grants and contracts by such agencies as the National Institute of Handicapped Research or indirectly through amending the Internal Revenue Code to create tax incentives (generally through accelerated depreciation) for targeted R&D activities.

Some economists believe that the conflicts over proprietary rights to information obtained through Government-supported research make Government cooperation unattractive to manufacturers (10). The manufacturers surveyed indicated that this is not a major problem. It seems likely that contracts could be negotiated that would satisfy both the manufacturer and the Government and would benefit the consumer by increasing the rate of innovation.

When questioned about patent rights, wheelchair manufacturers felt that they were not of major importance because the firms cannot count on having the 17-year period of sole design that patents are supposed to provide. Lawsuits alleging patent infringement are seen as an expensive stalling tactic, designed to give a product a strong foothold in the market before competitors can make a similar product. It was agreed that making a similar product that does not infringe upon a patent is not difficult for a determined competitor. Being first on the market was considered to be a significant advantage.