New Product Quality and Timing under Competition

Professor Sudhakar D. Deshmukh
Kellogg School of Management
Northwestern University
Evanston, IL 60208
U. S. A.

Abstract

Better quality products capture larger market shares and yield higher profits. However, improving product quality takes time, during which a competitor may develop and introduce a product to usurp a market share, leaving a smaller market for the laggard firm. Competing firms must balance these two effects in determining their strategies of new product development of quality and timing of its introduction.

We model this innovation competition as a stochastic game between two firms and characterize their equilibrium strategies. We show that in equilibrium, each firm will set a target quality that it aims to develop before introducing the product into the market. The technologically stronger firm is shown to set a higher target quality and capture a larger market share than the weaker firm. Competition to be the first is shown to induce both firms to set lower targets and introduce inferior products sooner than they would without competition. However, the consumers are shown to be better off with competition than with a weak monopolist. A strong monopolist is shown to yield an even better outcome for the consumers, which is in fact shown to be socially optimal. Finally, this socially optimal outcome is also attainable with competition among equally strong firms, and is in fact attained at a pace faster than that with a monopolist. Thus, competitive innovation among competitors of equal strengths is shown to be the best industrial structure for the society.