The optimal R&D and output strategy of the duopoly manufacturers

Yi-Chun Weng *

Department of Business Administration
The Overseas Chinese University
No. 100, Chiao Kwang Rd.
Taichung 407
Taiwan

Abstract

This thesis takes the two-stage duopoly model to probe into the optimal R&D and output strategies of the duopoly manufacturers. In this text, the important factors that affect the strategies are product substitution parameter, R&D yield overflow parameter, R&D efficiency parameter, unit cost, and market parameter. The cooperation R&D strategy of the duopoly manufacturers will make the R&D level closer to the social optimal R&D level, when it comes to the R&D yield overflow parameter is 50% greater than the product substitution parameter. And given that some parameters requirements are satisfied, when the R&D yield overflow parameters changes, the adjustment of the equilibrium of R&D cost and output is decided by whether the duopoly manufacturers adopt the cooperative or the uncooperative strategy in the R&D game.

Keywords: Game theory, duopoly, R&D.

1. Introduction

In 1838, Cournot [3] probed into the static interaction of the duopoly manufacturers, taking the mineral spring water market as the example. Since the products are assumed homogenous, there is only one price, that is to say the manufacturers take the output as their decision variable. With the thinking of output strategy, Edgeworth [5] put forward the cooperation coefficient, it thinks that the enterprises can pursue a high weighted average of their own profits and the industry’s, and make it the output strategy standard. That is to say that this model brings in

*E-mail: icwong@ocit.edu.tw

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