中國文化大學商學院全球商務碩士學位學程
碩士論文

Master's Thesis
Master Program of Global Business
College of Business
Chinese Culture University

策略動態學應用於引擎市場定價模式

Strategy Dynamics Pricing Model with Applications in Industrial Engine Market

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中華民國 104 年 12 月
December, 2015

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ABSTRACT

Pricing decision is regarded as one of the most important tactics for firms to overcome their rivals in a competitive market, especially in dual competition and oligopolistic market. In economic theories, diverse pricing models were proposed in which game theory has been one of the dominant classical models for price competition such as the Prisoner's Dilemma and Bertrand duopolistic competition model. Other research fields such as operational theories and industrial marketing also highlighted the relationships between pricing decisions and operational outcome as well as various pricing strategies for different competitive fundamental situations. Although previous studies have addressed the strategies and tactics of price competition with diverse models, there are insufficient systematic analyses regarding the competitive pricing behaviors in a dynamics context. Therefore, this research aims to develop a proper pricing model to enhance the capacity of analyzing the strategic roles of pricing decisions in a duopolistic market with a systematic viewpoint.

The System Dynamics methodology and its Strategy Dynamics approach was adopted as the main methodology in this research. First, the strategic roles of pricing strategies for innovative products in a duopolistic market were conceptualize with a systematic viewpoint by the system thinking approach. A new Strategy Dynamics Pricing Model which reflects the competitive pricing behavior for innovative products in a duopolistic market was also proposed. A simulation model with a real world case study of portable gasoline engine market in Taiwan is then developed for demonstrating its decision support functions by analyzing strategic pricing behavior and its impacts on the

duopolistic market. Finally, the managerial implications for proper pricing strategies are evaluated through iterative simulations.

The proposed model has successfully demonstrated its capacity on enhancing the understanding of the duopolistic competition system as well as successfully on integrating with various analysis techniques such as sensitivity analysis, scenario planning and game theory analysis. Base on the results derived from iterative simulations with proposed pricing model, an optimal pricing zone in which the firm could improve its profitability as well as a nonlinear relationship between pricing decision and profitability are found. It is also found that the pricing decisions would be less efficient over time and there are existence of moderator effects of market demand conditions on the relationships between product quality improving decisions and firms' business performance.

Keywords: Pricing, Innovation, Decision Making, System Dynamics, Duopolistic Competition, Simulation.

ACKNOWLEDGEMENT

I could not be able to complete this research without helps from my advisor - Professor Min-Ren Yan, as well as my family and friends.

Therefore, firstly, I would like to gratefully and sincerely thank for Professor Min-Ren Yan who has always patiently and enthusiastically guided me in conducting my research. His knowledge and experience are very admirable. He inspires me many ideas to progress more in my long-term career goals. In my mind I thank him so much. He is the one I want to follow to explore and absorb all of his knowledge. Hoping we still keep contact and he still helps me to do more researches even though we are far away from each other. Hoping he always has a good health to instruct more students.

Secondly, importantly, I would like to thank my fiancée and my family members for their unconditional love and understanding as well as their continuously encouragement and support. I could not finish this research and completing the master degree graduation requirement within the planned time without all of their support and care.

Then, I would like to share the credit of my work with some of my friends and classmates who had helped and encouraged me, less or more, to conduct this academic research.

Danh-Nhan Tran

December 2015

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