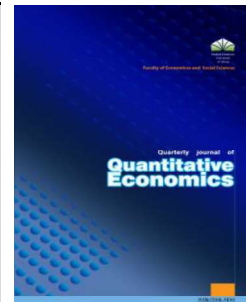





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Effect of Consumers' Behavior on Duopoly Market Structure

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EXTENDED ABSTRACT

Along with the competitive behavior of producers, consumers' behavior significantly influences the market structure. The temporal resolution of recursively repetitive interactions between producer firms and consumers creates and shapes the structure of the market and defines the firms' market shares. In order to explore this issue, we require a comprehensive model considering the behaviors of both sides, such that the variation of the parameters of the model reflects the competitive policies of the producers and the diversity and differences among the spirits of the consumers. The proposed model of this paper is based on these viewpoints and, by variation of its parameters, the effects of consumers' behavior and moods on producers' market shares are simulated. The developed model includes two sub-models. The first is based on the theory of differential games to represent the competitive behaviors of producers. The second is agent-based which is developed through learning and choice pattern to illustrate the consumers' behavior in an oligopoly market.

In a numerical example of this model, producers apply their policies in 5 intervals such that between any two intervals of policy application, consumers buy and consume goods in 5 subintervals through which the consumers have the opportunity to learn and gain new experience. In this example, it is observed that the tendency of consumers towards new experiences, the degree of relative importance, that the consumer attaches to their high level of desires, the duration or opportunity of learning and gaining new experience and the delay in the policy implementation, all together, affect the market shares of producers. It is also shown that from perspective of this model, market shares do not change dramatically compared to their initial conditions in the case of belief-based learning; but, in the case of reinforcement learning, consumer behavior becomes more random. In case of belief-based learning, it is expected that as the number of consumers seeking new experience decreases, the market shares diverge. Similarly, increasing in the degree of optimization in the random selection law, in both belief-based and reinforcement learning cases, leads to the increasing of the divergence in market shares. Here, the number of sub-intervals indicates the required time for producers to implement their new market policies. As the number of sub-intervals increases or decreases, convergence of market shares increases, under both types of learning. Delays in the implementation of policies by a producer, in the case of belief-based learning will be in its favor; and, in the case of reinforcement learning such delay will be in adverse of that producer.

The presented model of this paper can be used by firms to test their competitive policies, by looking at different scenarios related to environmental conditions and the behavior of consumers prior to deployment of those policies.

INTRODUCTION

Scope and purpose of the article is to use a comprehensive model to study the impact of consumer behavior on firms' market shares in Duopoly market. Along with the competitive behavior of producers, consumers' behavior significantly influences the market structure. The temporal resolution of recursively repetitive interactions between producers and consumers creates and shapes the structure of the market and defines the firms' market shares. In order to explore this issue, we require a comprehensive model considering the behaviors of both sides, such that the variation of the parameters of the model reflects the competitive policies of the producers and the diversity and differences of the behaviors among the consumers. The literature has been studied in the areas of paradigm perspectives, differential game theory, competitive behavior of firms and consumer behavior in the market and Agent-based modeling in economics to develop such a comprehensive model. The contribution of this study, is mainly related to the comprehensiveness of the model used to conduct this study.

METHODOLOGY

The proposed model of this paper is based on the viewpoints stated in introduction section, and by variation of its parameters the effects of consumers' behavior and moods, on producers' market shares are simulated. The developed model includes two sub-models. The first is based on the theory of differential games to represent the competitive behaviors of producers. The second one is agent-based which is developed through learning and choice pattern to illustrate the consumers' behavior in an oligopoly market. In a numerical example of this model, producers apply their

policies in 5 intervals such that between any two intervals of policy application, consumers buy and consume goods in 5 subintervals through which the consumers have the opportunity to learn and gain new experience.

FINDINGS

According to the results of the research model (political economy of Kuznets curve), although Kuznets hypothesis in the example, it is observed that the tendency of consumers towards new experiences, the degree of relative importance, that the consumer attaches to their high level of desires, the duration or opportunity of learning and gaining new experience and the delay in the policy implementation, all together, affect the market shares of producers. It is also shown that from perspective of this model, market shares do not change dramatically compared to their initial conditions in the case of belief-based learning; but, in the case of reinforcement learning, consumer behavior becomes more random. In case of belief-based learning, it is expected that as the number of consumers seeking new experience decreases, the market shares diverge. Similarly, increasing in the degree of optimization in the random selection law, in both belief-based and reinforcement learning cases, leads to the increasing of the divergence in market shares. Here, the number of sub-intervals indicates the required time for producers to implement their new market policies. As the number of sub-intervals increases or decreases, convergence of market shares increases, under both types of learning. Delays in the implementation of policies by a producer, in the case of belief-based learning will be in its favor; and, in the case of reinforcement learning such delay will be in adverse of that producer.

CONCLUSION

Consumers' behavior significantly influences the market structure and it was demonstrated by a model. The presented model in this paper can be used by firms to test their competitive policies, by looking at different scenarios related to environmental conditions and the behavior of consumers prior to deployment of those policies. In addition, this model can be used as a laboratory to teach the performance and structure of Duopoly and Oligopoly markets.

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