

Introduction to the Special Issue on Industrial Organization

Rabah Amir¹ · Hassan Benchenkroun² ·
Luca Lambertini³

Published online: 19 November 2015
© Springer Science+Business Media New York 2015

Dynamic games have proven to be a natural and powerful tool in modeling and understanding a number of important phenomena in industrial organization. This framework allows for a parsimonious modeling of market interactions over time, when at least some of the economic agents are non-atomic and decisions at a given moment impact the nature of market competition in the future in a way captured by natural state variables. A key feature of this setting is that, being cast most often in infinite-horizon models, dynamic games avoid end-of-horizon effects that can easily condition conclusions obtained with finite-horizon models, in particular with the two-stage paradigm commonly used in industrial organization.

This special issue contains both original articles and reviews of important recent strands of literature dealing with the application of the dynamic games paradigm in industrial organization, broadly defined.

The theory of real options initiated in the seminal book by Dixit and Pindyck [5] is a powerful tool to examine the timing of lumpy irreversible investment. Huberts, Huisman, Kort and Lavrutich review a recent strand of the real options literature where decision makers choose both the timing and the size of the investment. This is an important extension that shows that, while the general wisdom that more uncertainty diminishes the value of waiting remains true, more uncertainty may also generate larger investments: Uncertainty may not hurt growth. An important and common feature in the real options literature is that the firms are assumed to be aware of an investment opportunity at all points in time. Bruno Versaveel examines an original research question related to irreversible lumpy investment: Firms do

✉ Hassan Benchenkroun
hassan.benchekroun@mcgill.ca

Rabah Amir
rabah-amir@uiowa.edu

Luca Lambertini
luca.lambertini@unibo.it

¹ Department of Economics, University of Iowa, Iowa City, USA

² Department of Economics, CIREQ, McGill University, Montreal, Canada

³ Department of Economics, University of Bologna, Bologna, Italy

not have the same information all the time; rather firms differ with respect to their alertness to the growth of an emerging market. The objective is to investigate how the possibly different dates of detection of a nascent demand (an *ex-ante* asymmetry) impact the entry decisions of two potential entrants and how they combine with a post-entry first-mover advantage (an *ex-post* asymmetry) for the characterization of equilibrium expected payoffs.

Another important stream of the industrial organization theory literature examines the implications of consumers' foresight. Long reviews a class of models in which consumers' foresight has a key role. An essential lesson learned from [3] is that the foresight of consumers may severely diminish the market power of monopolists and oligopolists, especially when the goods are durable and the firms lack the ability to commit to future prices and/or outputs. The paper reviews a number of important contributions that separately explore the role played by a host of factors in restraining market power. These factors include the length of time between two consecutive offers, the rate of depreciation of the durable goods, the product lines offered by firms producing the durable goods, the nature of network externalities in the primary market and the aftermarkets and the ability of firms to rely on reputational effects. The paper also reviews related issues such as consumption capital in the case of addictive goods, anticipation of future network congestion and sales of assets such as shares of a firm's subsidiaries or shares of a majority shareholder who has an influence on managers.

Kagan van der Ploeg and Withagen analyze an important instance of a market where the buyer and the seller are farsighted. They study a dynamic game between an oil-exporting country with monopoly power on global oil markets and an oil-importing country, which is concerned with combating climate change. Their framework takes account of the scarcity of fossil fuel and allows for both the Pigouvian and the import tariff motive [2,8] for carbon taxation. They conduct numerical illustrations based on empirical evidence. The simulations indicate that the initial feedback equilibrium consumer price is always higher than in the open-loop Nash equilibrium, which leads to a delay in oil extraction and carbon emissions, and hence lower damages from global warming.

Jorgensen and Sigué examine management strategies in growing markets. Their paper is the first to develop an extension of the Lanchester advertising model that allows for marketing activities at three different segments: rival firms' customers (offensive advertising), own customers (defensive advertising) and potential customers (generic advertising). Thus, a wide range of marketing practices are covered within these three segments: creating awareness of a new product, promoting new uses of a product in a mature market and creating loyalty and influencing switching costs.

Fabra and Garcia examine the effect of switching costs on firms' strategic pricing strategies. Established mostly via the usual simple setting of two-stage models, the conventional wisdom from the extant literature generally points to an anti-competitive effect of switching costs (see [7] for a survey). However, among some other results, Fabra and Garcia establish that, that in the framework of an infinite-horizon, continuous-time dynamic model of competition, when firms are not able to discriminate between new and old customers, switching costs can have a pro-competitive effect in the long run. This plausible conclusion emerges when firms' market shares are sufficiently symmetric. This is an interesting instance where open-ended dynamics can lead to novel insights relative to a two-stage game, and even to a reversal of some basic conclusions.

Wiszniewska-Matyszek, Bodnar and Mirota offer a comprehensive analysis of an infinite-horizon continuous-time oligopoly model with sticky prices in the tradition of Fershtman and Kamien [6] for the set of open-loop strategies as well as for the set of closed-loop strategies.

Kobayashi examines the issue of R&D cooperation versus R&D competition in a long-run dynamic oligopoly where R&D investments build onto a stock of R&D capital, with R&D spillovers being taken into account. This paper may therefore be seen as an infinite-horizon counterpart to the usual two-stage model commonly used in industrial organization. As such, it nevertheless end up deriving more general versions of the well-known conclusions on the comparison between cooperative and noncooperative R&D, thus reinforcing the robustness of past results in the related literature (e.g., [1,4]).

We would like to thank the contributors to this special issue. We are also grateful to Georges Zaccour, the Editor-in-Chief, for initiating the idea of this special issue and for his input and encouragements throughout the process. The solid work of the reviewers through their constructive suggestions and criticisms is gratefully acknowledged.

References

1. Amir R (2000) Modelling imperfectly appropriable R&D via spillovers. *Int J Ind Organ* 18:1013–1032
2. Brander JA, Spencer BJ (1984) Trade warfare: tariffs and cartels. *J Int Econ* 16:227–242
3. Coase RH (1972) Durability and monopoly. *J Law Econ* 15:143–149
4. d’Aspremont C, Jacquemin A (1988) Collusive and non-collusive R&D in duopoly with Spillovers. *Am Econ Rev* 78:1133–1137
5. Dixit A, Pindyck R (1994) *Investment under Uncertainty*. Princeton University Press, Princeton
6. Fershtman C, Kamien M (1987) Dynamic duopolistic competition with sticky prices. *Econometrica* 55:1151–1164
7. Farrell J, Klemperer P (2007) Coordination and Lock-in: competition with switching costs and network effects. In: Armstrong M, Porter R (eds) *Handbook of industrial organization*, vol 3. North-Holland, Amsterdam
8. Spencer BJ, Brander JA (1983) International R&D rivalry and industrial strategy. *Rev Econ Stud* 50:707–722