Dynamics and Stability in Retail Competition

Marcelo J. Villena, Axel A. Araneda∗

Faculty of Engineering & Sciences, Universidad Adolfo Ibáñez
Avda. Diagonal las Torres 2640, Peñalolén, 7941169, Santiago, Chile.

Abstract
Retail competition today can be described by three main features: i) oligopolistic competition, ii) multi-store settings, and iii) the presence of large economies of scale. In these markets, firms usually apply a centralized decisions making process in order to take full advantage of economies of scales, e.g. retail distribution centers. In this paper, we model and analyze the stability and chaos of retail competition considering all these issues. In particular, a dynamic multi-market Cournot-Nash equilibrium with global economies and diseconomies of scale model is developed. We confirm the non-intuitive hypothesis that retail multi-store competition is more unstable that traditional small business that cover the same demand. The main sources of stability are the scale parameter, the number of markets, and the number of firms.

© 2016 M. Villena & A. Araneda

Keywords: Multi-market Oligopoly, Cournot-Nash competition, Economies of Scale, Stability, Bifurcations, Chaos.

1. Introduction

In an oligopolistic setting under a Cournot scheme [25], the strategy of each economic player depends on its own quantity decision, and on its rival’s reaction. Puu was one of the first to explicitly show the complex dynamics of the oligopolistic setting under simple assumptions (isoelastic demand function and constant marginal cost) for two and three players [42, 43, 44]. This kind of analysis has grown significantly during the last decade in both, the mathematics and complex systems literature, as well as in the economically-oriented journals.

Indeed, since the Puu’s approach, several games has been developed for the study of the market stability, focusing on: different demand or price function [9, 40], number of players [5, 46], behavioral assumptions (naive [24, 37, 19], versus adaptive [13, 18], bounded rationality [3, 40, 52] or heterogeneous expectations [1, 2, 8, 36]). In terms of the cost function definition, several developments has been proposed as well, as non-linear cost function [52, 28, 40, 36, 18], capacity constraints [48, 47, 18, 34] and some spillover effects [15, 14, 17, 16].

Most works in this line of research have concentrated in single markets with linear production structures (i.e. assuming constant returns to scale). Nevertheless, oligopolistic competition today seems to present multi-market phenomena and, in some cases, they showcase important economies of scale, especially in the retail industry. Indeed, supermarket chains and retailers of food, gasoline, supplies and services all compete for market share through multi-store formats over geographically separated markets. This localized competition is presented in different levels: city, region, or country. In this context, companies segment their strategies, tailoring their selected outcome for different

∗Corresponding author:
Email addresses: marcelo.villena@uai.cl (Marcelo J. Villena), axel.araneda@uai.cl (Axel A. Araneda)
دریافت فوری
متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات