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ADVERTISING COMPETITION WITH MARKET EXPANSION FOR FINITE HORIZON FIRMS

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Abstract. Firms that want to increase the sales of their brands through advertising have the choice of capturing market share from their competitors through brand advertising, or increasing primary demand for the category through generic advertising. In this paper, differential game theory is used to analyze the effects of the two types of advertising decisions made by firms offering a product in a dynamic duopoly. Each firm's sales depend not only on its own and its competitor's brand advertising strategies, but also on the generic advertising expenditures of the two firms. Closed-loop Nash equilibrium solutions are obtained for symmetric and asymmetric competitors in a finite-horizon setting. The analysis for the symmetric case results in explicit solutions, and numerical techniques are employed to solve the problem for asymmetric firms.

1. **Introduction.** There are two types of advertising available to a firm to increase the sales of its brand offering, namely, generic advertising which expands the market for the entire product category and brand advertising which increases the firm's market share vis-à-vis other brands in the category. Brand advertising makes consumers aware that the brand is a potential substitute for the brand they currently use. It provides consumers with information about the brand's characteristics, and thus helps differentiate the brand from competing brands and attract customers from the firm's competitors. Generic advertising generates new customers by targeting beliefs about product categories and not particular brands within the category.

In this paper, we determine how much firms should contribute towards generic advertising and how firm and competitive factors influence their contributions. Extant research on optimal advertising policies for competition is limited to either static models that incorporate the two types of advertising (e.g., [15]) or dynamic models that do not explicitly consider generic advertising (e.g., [19, 5, 21, 23]). Thus, a contribution of this paper is to examine dynamic competition in brand and generic advertising. Since both advertising and sales are time-varying, we use dynamic optimization techniques and, in particular, differential game theory to analyze the situation [22, 6, 11].

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