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Competition Models with Mixed Multinomial Logit Demand Functions

Abstract: In this paper, we postulate a general class of price competition models with Mixed Multinomial Logit demand functions under affine cost functions. We first characterize the equilibrium behavior of this class of models in the case where each product in the market is sold by a separate, independent firm and customers share a common income level. We identify a simple and very broadly satisfied condition under which a Nash equilibrium exists while the set of Nash equilibria coincides with the solutions of the system of First Order Condition equations, a property of essential importance to empirical studies. This condition specifies that in every market segment, each firm captures less than 50% of the potential customer population when pricing at a level which, under the condition, can be shown to be an upper bound for a rational price choice for the firm irrespective of the prices chosen by its competitors. We show that under a somewhat stronger, but still broadly satisfied version of the above condition, a unique equilibrium exists. We complete the picture, establishing the existence of a Nash equilibrium, indeed a unique Nash equilibrium, for markets with an arbitrary degree of concentration; under sufficiently tight price bounds. We then discuss two extensions of our model: unequal customer income and a continuum of customer types. A discussion of the multi product case is included in the appendix. The paper concludes with a discussion of implications for structural estimation methods.