Identification and Estimation of Demand Models with Endogenous Product Entry

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Abstract

The estimation of demand models for differentiated products often relies on data from multiple geographic markets and time periods. The fact that firms do not offer some products in some markets generates a problem of endogenous selection in demand estimation. The non-additivity of demand unobservables in firms' expected profit and the potential multiplicity of equilibria in the entry game, make this selection problem challenging. Standard two-step methods to account for selection provide inconsistent estimates of structural parameters. Recent proposed methods require parametric assumptions on the distribution of unobservables as well as repeatedly computing for equilibria in the game. In this paper, we show the identification of demand parameters in a structural model of demand, price competition, and market entry that allows for a nonparametric distribution of demand unobservables. We propose a two-step method that extends standard methods to control for selection bias. We illustrate our method using simulated data and real data from the airline industry. We show that not accounting for endogenous product entry generates substantial biases that can be even larger than those from ignoring price endogeneity.