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Identification and Estimation of Demand for Bundles: The Case of the RTE Cereal Industry

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We study the identification and estimation of a mixed logit model of demand for bundles. We generalize the model proposed by Gentzkow (2007) in three ways. First, we allow the demand synergies among products (capturing complementarity and substitutability) to be bundle-individual specific and treated as random coefficients. Second, we allow the joint distribution of the random coefficients to belong to any parametric family. Third, our arguments are not specific to the three-bundle case but are directly developed for choice sets of any size. We propose sufficient conditions for identification and for lack of it. Our sufficient conditions for identification also guarantee consistency and asymptotic normality of a constrained MLE that alleviates the challenge of dimensionality inherent in estimation, and it is robust to both price endogeneity and sampling error in the observed market shares. We use our methods to investigate the welfare implications of mixed bundling pricing in the ready-to-eat cereal industry in the USA. The profit gains of mixed bundling pricing with respect to pure components pricing are sharply decreasing in the level of competition: while a monopolist would benefit from mixed bundling, the observed oligopoly would not-even ignoring potential increases in logistics costs. Given any market structure, mixed bundling leads to lower levels of consumer surplus than pure components.