

SEMINAR SERIES  
Department of Quantitative Analysis and Operations Management  
College of Business Administration  
University of Cincinnati

**“A Choice Model for Packaged Goods:  
Dealing with Discrete Quantities and Quantity Discounts”**

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Utility maximizing solutions to economic models of choice for goods with either discrete quantities or non-linear prices cannot always be obtained using standard first-order conditions such as Kuhn-Tucker and Roy's identity. When quantities are discrete, there is no guarantee that derivatives of the utility function are equal to derivatives of the budget constraint. Moreover, when prices are non-linear, as in the case of quantity discounts, first order conditions can be associated with the minimum rather than the maximum values of utility. In these cases the utility function must be directly evaluated to determine its maximum. This evaluation can be computationally challenging when there exists many offerings and when stochastic elements are introduced into the utility function. In this paper we provide an economic model of demand for substitute brands that is flexible, parsimonious and easy to implement. The methodology is demonstrated with a scanner panel dataset of light beer purchases. The model is used to explore the effects of price promotions on primary and secondary demand, and the utility of product assortment.

Greg Allenby holds the Helen C. Kurtz Chair in Marketing and is Professor of Marketing and Statistics in the Fisher College of Business at OSU. Prof. Allenby is a leading authority on Hierarchical Bayesian models and their application to marketing. He has published over 35 articles on marketing models in several respected journals such as *Marketing Science*, *Journal of Marketing Research*, *Marketing Letters*, *Journal of Business and Economics Statistics*, and *Journal of the American Statistical Association*. He has served on the editorial boards and/or been an associate editor of many of these same journals as well. Currently, he serves as Chair of the Marketing Section of the American Statistical Association and is Vice President of the Research Council of the American Marketing Association.