

Modeling the Evolution of Customers' Service Portfolios

David A. Schweidel

Eric T. Bradlow

Peter S. Fader

David A. Schweidel is an Assistant Professor of Marketing at the Wisconsin School of Business at the University of Wisconsin-Madison. His research interests are in the development and application of statistical models to CRM and media-related problems.

Eric T. Bradlow is the K.P. Chao Professor, Professor of Marketing, Statistics and Education, and Co-Director of the Wharton Interactive Media Initiative (<http://wimi.wharton.upenn.edu>) at the Wharton School of the University of Pennsylvania. His research interests are in the development of statistical methods for unique data structures with applications in Marketing, psychometrics, education, and health-care outcomes.

Peter S. Fader is the Frances and Pei-Yuan Chia Professor of Marketing and Co-Director of the Wharton Interactive Media Initiative (<http://wimi.wharton.upenn.edu>) at the Wharton School of the University of Pennsylvania. He believes that “Wheel of Fortune” should charge more for vowels.

Modeling the Evolution of Customers' Service Portfolios

Abstract

Understanding how customers' service portfolios evolve over the course of their relationship can provide multi-service firms, such as telecommunication and financial service providers, with useful guidance for managerial issues such as customer valuation and targeting. Complicating matters, however, is the fact that ownership of individual services may be related to each other. Additionally, customers may be highly heterogeneous in terms of the portfolios they choose and the sequence of adoption/retention decisions they make over time. In this research, we propose a joint timing and multivariate choice model that nests extant single-product models to capture co-purchasing behavior and underlying choice dynamics.

We employ a hidden Markov model to identify latent relationship states through which households may pass during their tenure as customers of the firm. These states enable us to understand how subscription patterns evolve over a customer's relationship, including changes in their preferences for the available services and the duration of time for which they will maintain their chosen portfolio. The proposed model also provides a framework within which multi-service providers can assess the value of their customers, as well as evaluate the impact of promotional activities.

We apply our modeling framework to data from a major telecommunications provider, for which we empirically identify three relationships states. The behavior of customers is found to vary across these states in three ways. First, the portfolios to which customers in each state are likely to subscribe differ. In addition, the duration for which customers are likely to maintain their chosen portfolio varies not only *across* the states, but *within* the state for different

portfolios. Lastly, customers in each of the states exhibit different tendencies to move between the states and to discontinue their relationship with the service provider.

Taking these three aspects together, we find that the value that customers represent to the service provider varies significantly across the states. It is not enough to just consider the number of services and their prices when evaluating a customer's lifetime value. When we account for the duration for which customers maintain their portfolios and the propensity to end the relationship with the service provider, we find that those customers who initially subscribe to many services are worth the most to the service provider, despite not having the longest expected tenure. In addition, while those customers who start with a minimal number of services may not spend as much each month, they are expected to maintain service the longest and are of more value to the service provider than customers who begin with service portfolios of an intermediate size.

We also introduce and explore the notion of the “terminal customers” – the propensity for current customers to discard all services on their next action, an important economic consequence to the firm. Companies can extract the remaining value from these customers by continuing to provide service. The firm should, however, think twice before investing substantially in them, as their next decision may be to terminate the relationship.