Fast-Track Article
Using Advance Purchase Orders
 to Forecast New Product Sales

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Marketers have long struggled with developing forecasts for new products before their launch. We focus on one data source—advance purchase orders—that has been available to retailers for many years but has rarely been tied together with postlaunch sales data. We put forth a duration model that incorporates the basic concepts of new product diffusion, using a mixture of two distributions: one representing the behavior of innovators (i.e., those who place advance orders) and one representing the behavior of followers (i.e., those who wait for the mass market to emerge). The resulting mixed-Weibull model specification can accommodate a wide variety of possible sales patterns. This flexibility is what makes the model well-suited for an experiential product category (e.g., movies, music, etc.) in which we frequently observe very different sales diffusion patterns, ranging from a rapid exponential decline (which is most typical) to a gradual buildup characteristic of “sleeper” products. We incorporate product-specific covariates and use hierarchical Bayes methods to link the two customer segments together while accommodating heterogeneity across products. We find that this model fits a variety of sales patterns far better than do a pair of benchmark models. More importantly, we demonstrate the ability to forecast new album sales before the actual launch of the album, based only on the pattern of advance orders.

(Advance Selling; Diffusion; Forecasting; Entertainment Marketing; Hierarchical Bayes Analysis; Stochastic Models)

Introduction

One of the key challenges in managing the launch of a new product is the attempt to obtain valid and reliable indicators about the product’s likely future sales levels before the product is actually launched. A novel approach to address this issue arises in the form of advance purchase orders. For decades, retailers in many different industries have accepted advance orders from customers before the launch of a new product, but until recently it had been virtually impossible to track these orders systematically and link them directly with postlaunch sales data.

This has changed with the advent of the Internet and the associated progress in information technology. Online retailers such as Amazon.com and CDNOW routinely promote the ability to buy an item several weeks before it is actually available, and their internal data-warehousing systems provide...