Incorporating Satisfaction into Customer Value Analysis: Optimal Investment in Lifetime Value

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Abstract

We extend Schmittlein et al.'s model (1987) of customer lifetime value to include satisfaction. Customer purchases are modeled as Poisson events and their rates of occurrence depend on the satisfaction of the most recent purchase encounter. Customers purchase at a higher rate when they are satisfied than when they are dissatisfied. A closed-form formula is derived for predicting total expected dollar spending from a customer base over a time period $(0, T]$. This formula reveals that approximating the mixture arrival processes by a single aggregate Poisson process can systematically under-estimate the total number of purchases and revenue.

Interestingly, the total revenue is increasing and convex in satisfaction. If the cost is sufficiently convex, our model reveals that the aggregate model leads to an over-investment in customer satisfaction. The model is further extended to include three other benefits of customer satisfaction: (1) satisfied customers are likely to spend more per trip on average than dissatisfied customers; (2) satisfied customers are less likely to leave the customer base than dissatisfied customers; and (3) previously satisfied customers can be more (or less) likely to be satisfied in the current visit than previously dissatisfied customers. We show that all the main results carry through to these general settings.