

## Abstract

Consumers commonly seek information from critic and consumer reviews when new product quality remains uncertain. However, consumer reviews are endogenous and may be subject to potential biases (e.g., self-selection). In this paper, we propose a new dynamic structural model where forward-looking consumers learn about quality from review ratings, make purchase decisions, and report consumer ratings post-purchase. In particular, the review-reporting component links unobserved heterogeneity in product valuation with consumer ratings, and allows us to examine the effect of pre-purchase quality beliefs on reported ratings. We apply the model to the US video game market. Our data consist of aggregate-level preorder sales, post-release monthly sales and prices, and individual-level critic and consumer ratings for 31 games released on SONY PlayStation 3. The preorder sales help identify the causal effect of review ratings on sales. Using the estimates, we quantify the effect of a price promotion during the preorder period. We demonstrate that if we ignore the endogeneity of consumer reviews, the effect of the price promotion can be over-estimated. This is because the price promotion attracts less enthusiastic consumers, which lowers the average consumer ratings subsequently. We further quantify the contributions of critic and consumer reviews to firms' profits.

**Keywords:** Critic and Consumer Reviews, Preorder, Product Quality, Bayesian Learning, Dynamic Programming Models, Bayesian Estimation, Video Games