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On Self-Selection Bias in Online Product Reviews

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Abstract

Online product reviews help consumers infer product quality, and the mean (average) rating is often used as a proxy for product quality. However, two self-selection biases, *acquisition bias* (mostly consumers with a favorable predisposition acquire a product and hence write a product review) and *under-reporting bias* (consumers with extreme, either positive or negative, ratings are more likely to write reviews than consumers with moderate product ratings), render the mean rating a biased estimator of product quality, and they result in the well-known "J-shaped" (positively skewed, asymmetric, bimodal) distribution of online product reviews. To better understand the nature and consequences of these two self-selection biases, we analytically model and empirically investigate how these two biases originate from consumers' purchasing and reviewing decisions, how these decisions shape the distribution of online product reviews over time, and how they affect the firm's product pricing strategy. Our empirical results reveal that consumers *do* realize both self-selection biases and attempt to correct for them by using other distributional parameters of online reviews, besides the mean rating. However, consumers *cannot* fully account for these two self-selection biases because of bounded rationality. We also find that firms can strategically respond to these self-selection biases by adjusting their prices. Still, since consumers cannot fully correct for these two self-selection biases, product demand, the firm's profit, and consumer surplus may all suffer from the two self-selection biases. This paper has implications for consumers to leverage online product reviews to infer true product quality, for commercial websites to improve the design of their online product review systems, and for product manufacturers to predict the success of their products.