

Do online reviews improve product quality? Evidence from hotel reviews on travel sites

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In this study, we use a game theoretic model to argue that the presence of online reviews can lead to product quality improvements for independent firms selling experience goods. We show that in categories where consumers are variety seeking in markets (such as travel), branded firms have a distinct credible signaling advantage for quality due to the network externalities of quality on repeat business. However, this signaling advantage is eroded when quality is revealed by online reviews. Consequently, the proliferation of online reviews should increase the quality of independent hotels, thereby decreasing the quality gap between independent and chain hotels over time.

We then evaluate the theoretical model empirically. First, we study the dynamic evolution of persistent trends in online review valence and adoption to obtain estimates of latent quality and review platform penetration across 40 thousand U.S. hotels spanning 5864 geographic markets using state space models. The state space modeling approach allows us to handle missing observations, noisy measurements, and extract seasonal variation using a parsimonious Fourier series approach. We demonstrate the convergent validity of using online reviews to estimate latent quality by comparing the quality estimates across reviews from several online travel sites. Further, we show the nomological validity of the estimated measure by demonstrating the expected changes in the measure after hotel renovations identified via text mining.

Second, we use the estimated heterogeneous review platform penetration and hotel quality across markets to test the predictions of our model. We show that markets with greater TripAdvisor penetration exhibit greater gains in independent hotel quality, as predicted. Independent hotels located in median peak TripAdvisor penetration markets improved their quality by an average of .129 stars as measured using composite online travel agent (OTA) star ratings, erasing 41% of the advantage held by chains in the absence of online reviews. In this empirical study, we resolve endogeneity due to potential unobserved confounds correlated with penetration and quality across markets and time. We do so by exploiting review platforms' imperfect market definitions that divide areas of hotel agglomeration into separate review platform markets, thus quasi-randomly assigning hotels in the same area to varying levels of online review exposure. Our research suggests that online reviews play an important role in facilitating competition on quality.

Key words: online reviews, state space models, product quality, hotel markets, geographic clustering
