Guiding Consumers through Lemons and Peaches: A Dynamic Model of Search over Multiple Characteristics*

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Abstract

The increasing amount of data available to consumers has most likely aided in decision-making. However, it has also created an opportunity for sellers to design the information landscape that consumers navigate. This paper develops a novel fully dynamic search model for alternatives with multiple characteristics, and reports estimation results for an online used car seller. The model allows characterizing search over alternatives with multiple characteristics that may be distributed arbitrarily. It also allows for a rich set of consumer search behaviors, including piecemeal search within and arbitrary paths across alternatives. We estimate the model using clickstream data on the website of a used car seller. The dataset tracks incremental search actions as well as test-drive reservations. The estimated fundamentals are then used to consider the effects of different information design policies. We find that the choice of the characteristics to be made available to consumers upfront may have conversion implications ranging from -0.39% to +1.65%. While the (theoretical) perfect information scenario increases conversion rates by 10.4%, we find that there is not a clear monotonic relationship between consumer search intensity and firm performance. Finally, we compare our model with the knowledge gradient model of learning (a myopic model used in the Operations literature), and show that taking forward-looking behavior into account explains the moments of the data better, and that the models' likelihoods are significantly different.

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