

MARKETING COLLOQUIA

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A HEURISTIC APPROACH TO EXPLORE: VALUE OF PERFECT INFORMATION

ABSTRACT: How do consumers choose in a dynamic stochastic environment when they face uncertainty about the return of their choice? The classical solution to this problem is to assume consumers use dynamic programming to obtain the optimal decision rule. However, this approach has two drawbacks. First, it is computationally very expensive to implement because it requires solving a dynamic programming problem with a continuous state space. Second, a decision maker is assumed to behave “as if” she optimally processes information regardless of its cognitive tractability. To address these two issues, we propose a new heuristic decision process called Value of Perfect Information (VPI), which extends the idea first proposed by Howard (1966) in the Engineering literature. This approach provides an intuitive and computationally tractable way to capture the value of exploring uncertain alternatives. Intuitively, in VPI, a decision maker investigates a subset of information which are expected by her to improve her myopic decision outcome. We argue that our VPI approach provides a “fast and frugal” way to balance the tradeoffs between exploration versus exploitation. More specifically, the VPI approach only involves ranking the alternatives and computing a one-dimensional integration to obtain the expected future value counterpart. In terms of computational costs, we show that the VPI approach is significantly simpler than the standard dynamic programming approach, making it a very practical learning model for consumers to employ. Moreover, the VPI approach provides switching patterns which differ from the independence of irrelevant alternatives (IIA) property, and generates potentially more realistic asymmetric switching reactions to price promotions. Using individual level scanner data, we find evidence that our VPI approach is able to capture consumers' choice well.