# Quantity-Based Price Discrimination Using Frequency Reward Programs

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## Abstract

This paper explores the quantity-based price discrimination of reward programs by analyzing estimates from a dynamic structural model of consumer choice applied to a reward program for a golf course. The expected value of participating in the program is shown to be negligible for low purchase probability golfers, but increasing monotonically with golfers' purchase probabilities. The marginal effects of the reward on qualifying purchases are also greater for high-volume consumers in most cases. An exception occurs when a firm limits the reward earning opportunities, so that these effects may actually be lower for high-volume individuals who earn all possible rewards without adjusting their behavior. Other counterfactual analyses demonstrate that the number of credits necessary to qualify for a reward and the time horizon for qualifying also influence the relationship between the program's effects on qualifying purchases and the distribution of consumers. We calculate the uniform price for each individual that is necessary to achieve equivalent effects to quantify the price discrimination of these programs. Under certain program parameters price discrimination can be virtually eliminated if it is an unintended consequence, as might be the case for airline and hotel programs

* This paper was first presented at the 2005 SICS conference (http://groups.haas.berkeley.edu/marketing/sics/Programsics2005.html ). The empirical demand model from the original version of the paper was extracted and applied to similar data to evaluate the switching costs effects of reward programs in the paper titled "Do Frequency Reward Programs Create Switching Costs?" For an updated version of this originally titled paper please contact the authors.