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Inertia and Variety Seeking in a Model of Brand-Purchase Timing

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Abstract

Previous research on state dependence indicates that a brand's purchase probabilities vary over time and depend on the levels of inertia and variety seeking and on the identity of the previously purchased brand. Brand-choice probabilities obtained from models such as the logit and the probit are, however, fixed over time, conditional on the previous brand purchased and on the levels of marketing variables. Consequently, state dependence has largely been studied as a time-invariant phenomenon in brand-choice models, with the levels of inertia and variety seeking assumed to be constant over time. To account for the time-varying nature of state dependence would require a model in which brand-switching probabilities depend upon interpurchase times. One modeling framework that can account for this dependence is based on the hazard function approach.

The proposed approach works as follows. All other factors being equal, an inertial household purchasing a brand on a particular occasion is most likely to repurchase that brand on the next occasion. If the household switches, it will be to a brand located perceptually close, in attribute space, to the previously purchased brand. In other words, an inertial household has the highest switching hazard for the same origin and destination brands, with a progressively lower hazard rate for brands perceptually located farther and farther away from the origin brand. The amount by which the hazard is lowered depends upon the perceptual distance and the inertia level of the household. On the other hand, if the household is variety seeking, the most likely brand purchased would be a brand located farthest away from the previously purchased brand in attribute space. In other words, the hazard rate of repurchase is the lowest, with the rate increasing with the distance of the destination brand from the origin brand and the level of that household's variety-seeking tendency. The effects of inertia and variety seeking

are, therefore, incorporated at the attribute level into a brand-purchase timing model. In doing so, we attempt to provide greater insight into the nature of state dependence in models of purchase timing.

Our model and estimation procedure will enable us to distinguish between households that are inertial and those that are variety prone. In addition to accounting for state dependence, the model also accounts for the effects of unobserved heterogeneity among households in their brand preferences and in their sensitivities to marketing activities. A majority of studies in marketing using the hazard function approach to investigate purchase timing have not accounted for heterogeneity in marketing-mix effects. The study integrates recent methods that incorporate the effects of inertia and variety seeking in brand-choice models with a semi-Markov model of purchase timing and brand switching. The proposed model enables us to (1) infer market structure via a perceptual map for the sample households, and (2) investigate implications for the introduction of a line extension.

We provide empirical applications of the proposed method using three different household-level scanner panel data sets. We find that differing levels of inertia and variety seeking characterize the three data sets. The findings are consistent with prior beliefs regarding these categories. In addition, our results indicate that the nature of interbrand purchase timing behavior depends upon the extent of inertia or variety seeking in the data. We are also able to characterize the structure of the three product markets studied. This provides implications for interbrand rivalry in the market. Further, we demonstrate how the model and results can be used to predict the location of a line extension in the perceptual space of households. Finally, we obtain implications for the timing of brand promotions.

(Hazard Models; Purchase Timing; Brand Choice)