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Looking for Loss Aversion in Scanner Panel Data: The Confounding Effect of Price Response Heterogeneity

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Abstract

Recent work in marketing has drawn on behavioral decision theory to advance the notion that consumers evaluate attributes (and therefore choice alternatives) not only in absolute terms, but as *deviations* from a reference point. The theory has important substantive and practical implications for the timing and execution of price promotions and other marketing activities.

Choice modelers using scanner panel data have tested for the presence of these “reference effects” in consumer response to an attribute such as price. In applications of the theory of reference-dependent choice (Tversky and Kahneman 1991), some modelers report empirical evidence of loss aversion: When a consumer encounters a price above his or her established reference point (a “loss”), the response is greater than for a price below the reference point (a “gain”). Researchers have gone so far as to suggest that evidence for the so-called reference effect make it an empirical generalization in marketing (e.g., Kalyanaram and Winer 1995, Meyer and Johnson 1995).

It is our contention that the measurement of loss aversion in empirical applications of the reference-dependent choice model is confounded by the presence of unaccounted-for heterogeneity in consumer price responsiveness. Our reasoning is that the kinked price response curve implied by loss aversion is confounded with the slopes of the response curves across segments that are differentially responsive to price. A more price-responsive consumer (with a steeper response function) tends to have a lower price level as a reference point. This consumer faces a larger proportion of prices above his reference point, thus the response curve is steeper

in the domain of losses. Similarly, the less price-responsive consumer sees a greater proportion of prices below his reference point, so the response curve is less steep within the domain of gains. As a result, any cross-sectional estimate of loss aversion that does not take this into account will be biased upward—researchers who do not control for heterogeneity in price responsiveness may arrive at incorrect substantive conclusions about the phenomenon. It is interesting to note that in this instance, failure to control for heterogeneity induces a bias in *favor* of finding an effect, rather than the more typical case of attenuation of the effect toward zero.

We first test our assertion regarding the reference-dependent model using scanner panel data on refrigerated orange juice and subsequently extend this analysis to 11 additional product categories. In all cases we find, as predicted, that accounting for price-response heterogeneity leads to lower and frequently nonsignificant estimates of loss aversion. We do, however, find some categories in which the effect does not disappear altogether. We also estimate loss aversion using a “sticker shock” model of brand choice in which the reference prices are *brand-specific*. In line with the results of the majority of prior literature, we find smaller and insignificant estimates of loss aversion in this model. We show that this is because in the sticker shock model, there is no apparent correlation between the price responsiveness of the consumer and the representation of reference effects as losses or gains. Our findings strongly suggest that loss aversion may not in fact be a universal phenomenon, at least in the context of frequently purchased grocery products. (*Choice Models; Reference Dependence; Loss Aversion; Sticker Shock; Reference Price; Empirical Generalization*)