On the Non-Equivalence of Trade-ins and Upgrades in the Presence of Framing Effect: Experimental Evidence and Implications for Theory

In nowadays durable-goods markets, due to fast new product introductions, replacement purchases have become the main portion of the market (e.g., more than 80% of computer sales are replacement purchases, more than 70% of iPhone buyers upgrade from previous iPhone models, etc.). Hence, manufacturers of durable goods have increasingly managed replacement purchases separately from their sales channels for first-time buyers, typically by buying back older versions of their products to offer price reductions to repeat customers. Trade-ins and upgrades are the two common mechanisms of replacement purchases. With a trade-in, replacement buyers are quoted a price for their current version when buying the new version at its regular sale price. With an upgrade, replacement buyers are offered the new version at a discounted price upon giving their current version to the dealer. In standard economic analysis, the two mechanisms are isomorphic when the trade-in value on the old version is equal to the discount value on the upgrade, and so they have been used interchangeably. There is ample evidence, however, that customers’ decision making in replacement purchases is driven mainly by behavioral influences. In particular, the non-equivalence of trade-ins and upgrades can no longer be expected to hold once one considers the framing difference between them, which resembles some of the seminal examples of the framing effect provided by Tversky and Kahneman (1981), and is particularly important since research has shown that when making a replacement purchase, customers are more sensitive to the selling transaction than to the buying transaction (e.g., Purohit 1995, Kim et al. 2011).

We study the framing effect in trade-ins and upgrades and explore how customers’ reference points for the price for their current version shift with the frame of the replacement purchase offer. The reference point, as the hinge of every utility driven decision making, is the key in explaining
most of behavioral anomalies, and the reference-point shift is the proper mechanism to capture the framing effect (Heath et al. 1995, Lehner 2000, Hossain and List 2012). Similar to reference-point studies with multiple price-anchors (see, e.g., Baucells et al. 2011), through an experimental study (with 1,195 participants in Amazon Mechanical Turk), we extract the influential anchors on replacement buyers’ reference points with trade-in and upgrade frames under difference market settings. Understanding what influences replacement buyers’ reference points, and how it shifts with the alternative frames, reveals the leverage and the proper frame that manufacturers can use to manage their customers’ reference points and thus their replacement decision. The straightforward application of this finding would be in developing reference-dependence models of trade-ins and upgrades to investigate how the framing difference between them would matter for manufacturers’ policies.

We find that since the upgrade frame embeds the selling transaction in a net buying transaction, it directs customers’ attention toward price anchors relevant to the buying position (i.e., the manufacturer’s sale prices), while the trade-in frame places customers in an explicit selling position and results in anchoring to prices relevant to that (i.e., the secondary market price). Therefore, the reference point shifts with the trade-in and the upgrade frame as a result of anchoring to different prices regarding the induced positions with them. In addition, different market settings influence the reference point with a given frame if they affect the set of price anchors relevant to the induced position. Furthermore, through a behavioral extension of the classical model of trade-ins and upgrades by Fudenberg and Tirole (1998), keeping our extension in line with the basics of PEEMs (Portable Extensions of Existing Models) (Rabin 2013), we find that their two key predictions, that under a high innovation level in the new version, the manufacturer will not continue producing the original version, and that the manufacturer is better
off in an anonymous market than in a semi-anonymous market, do not hold anymore. Their second prediction, laid out through a comparison of trade-ins (for the anonymous case) and upgrades (for the semi-anonymous case), is a result of their first prediction, which is, of course, at odds with the numerous instances we see in nowadays markets (e.g., for successive iPhone series). We find that in these cases that manufacturers’ objective in continuing production and sale of older versions is to manage the upgraders’ reference points through the sale price of the older version. This explanation, which is salient in nowadays durable-goods markets with extensively grown segment of replacement buyers, can only be obtained through the behavioral extension.

References