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Search deterrence in experimental consumer goods markets☆

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ABSTRACT

In consumer goods markets, theory shows that it is generally profitable for sellers to use search-deterrence strategies to alter buyer search. These results rely on agents' reacting solely to the economic content of these pressure tactics, ignoring any behaviorally based responses search deterrence may evoke. To test the validity of this assumption, this paper examines an experimental market where profit-maximizing strategy dictates that sellers should exercise one form of search deterrence, exploding offers. Sellers demonstrate a reluctance to use such offers against human buyers, but they are less reluctant to use them against computerized buyers. Human buyers are three times more likely to deviate from optimal strategy by rejecting rather than accepting these offers. Survey responses are consistent with other-regarding-preference-based reasons for sellers' actions but not buyers'. Taken together, these results suggest the benefits of tactics that rely on pressuring decision-makers may be more nebulous than previously thought.

1. Introduction

Many markets are modeled as dynamic. For instance, buyers search and learn new information about their valuations over time before finalizing purchase decisions. Recent theory developments (Armstrong and Zhou, 2016; Courty and Hao, 2000; Nocke et al., 2011) show sellers often earn more than a static price discrimination theory would predict. They do so by using dynamic contracts to alter buyers' information structure. Implicit in the execution of these contracts is the pressure sell. Sellers prod buyers to make a decision immediately rather than at their leisure. While perfectly rational agents will respond to this pressure in a manner consistent with theory, other agents may respond to increased pressure—or even the thought of increased pressure on someone else—with a suboptimal, behaviorally based response.[1]

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[1] Beginning with Güth et al. (1982), there is a substantial body of literature showing that actions that violate some form of fairness are met with a negative response, even in a single-shot setting (Cooper and Kagel, 2016). We interpret a plausible extension of this research that buyers would negatively

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This paper examines this question in a laboratory experiment designed to implement a simplified consumer search model (Armstrong and Zhou, 2016): two sellers simultaneously choose one of three prices and make either an exploding or non-exploding offer.[2] Buyers, previously unaware of their (personal) value for either seller's good, randomly visit one seller and learn their (personal) value for that seller's good. In doing so, they receive the seller's offer. The buyers must then decide whether to visit the other seller. If the first seller makes an exploding offer, a visit to the second seller will terminate the opportunity to buy from the first seller.

Because seller behavior is conditional on perceived buyer response, two treatments are used to isolate seller behavior. In one, sellers knowingly interact with computer buyers programmed to follow optimal strategy; in the other, they interact with human buyers. Common across both treatments is the equilibrium prediction. The opportunity to use exploding offers removes the incentives for sellers to compete on price; they will play a pure strategy of charging the highest price with an exploding offer.[3] Buyers will reject or accept exploding offers, unbiasedly, based on expected value and profit maximization.

In contrast to the equilibrium prediction, human buyers are three times more likely (i.e., 15 probability points more) to violate profit-maximizing strategy by rejecting an exploding offer than accepting it. This differential rate of suboptimal play alters sellers' incentives; seller's best-response is to charge the lowest price, albeit with an exploding offer. In a deviation from this best response, sellers use exploding offers about two-thirds as often against human buyers as they do against computer buyers. Overall, sellers play the equilibrium strategy five times more often against computer buyers than human buyers.

Though our design features only exploding offers, we suspect the basic flavor of these results—that buyers and sellers respond more negatively to pressure sales tactics than standard theory predicts—applies to all forms of search deterrence, a tactic that is continually evolving and expanding in the field.[4] Originally, cases of consumer search deterrence were confined to specific markets and situations. Literature suggests use of exploding offers was common among professional salespeople (Cialdini, 2003) and health clubs offering memberships (Xiong and Chen, 2014). Buy-now discounts were noted in home improvement service contracts (Bone, 2006) and housing rentals (Robinson, 1995). Internet commerce expanded its scope, in part, by greatly reducing the costs of maintaining, tracking, and notifying customers for search deterrence. Tracking "cookies" may lead to increases in prices should a consumer leave a website and return. "Daily deals" or "flash sale" websites now market limited-time offers to registered customers by email, text or social networks. The initial market valuations of flash sale websites and single-day revenues of the most popular daily-sale events are on the order of magnitude of billions of dollars.[5] Recent patents suggest search-deterrence technology will only improve.[6] Closely related to the expansion of search-deterrence strategies is the movement in consumer protection policies. In 2005, the European Union began prohibiting sellers from making false claims about product availability "in order to elicit an immediate decision and deprive consumers of sufficient opportunity or time to make an informed choice."(Armstrong and Zhou, 2016)

However, there need not be one single underlying mechanism for sellers' and buyers' departures from equilibrium play. Our survey results find separate patterns behind buyer and seller responses. Buyers who answer the fewest questions correctly on the Cognitive Reflection Test (CRT; Frederick, 2005) are most likely to reject an exploding offer they should accept. Such buyers are no more or less likely to accept an exploding offer they should reject, creating a differential negative response to exploding offers. The same test does not predict seller exploding offer use. On exit surveys, about a third of sellers indicate a reliance on free-recall offers, often justified by how an exploding offer would affect buyers. These sellers are far less likely to use exploding offers. Interestingly, not one buyer indicates a corresponding concern about the effects of exploding offers. Our interpretation is that sellers' reluctance to use exploding offers is driven by other regarding preferences, but buyers are intuitively (rather than deliberately) biased toward rejecting exploding offers. Having two separate triggers for suboptimal play under pressure tactics broadens the implications of our findings. It is well known that fairness and norm considerations can alter strategies used in markets (Kahneman et al., 1986); less is known about the implications of buyers' rejecting pressure sales innately, even when the sellers' intentions are benevolent. In our conclusion, we explore such implications within and outside the context of search deterrence.

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reciprocate against a pressure sell, and sellers would be reluctant to make such sells. There is empirical precedent for such thinking (see Kahneman et al., 1986). Similarly, a large body of literature is generally consistent with the idea that pressure exacerbates optimal decision-making (for example, see Shah et al., 2012).

[2] The exploding offer is an offer that is valid for only a short time period; the period is short enough to ensure that the receiver of the offer cannot find any new competing offers before deciding on the current offer. In the experiment, we assume the offer expires instantly after a buyer's visit.

[3] Exploding offers will cause high-valuation buyers to buy immediately from the seller and may drive away medium-valuation buyers who would have returned to buy the product if their search was not deterred. If the distribution of buyers is increasing in valuation, these tactics will be more profitable, compared to regular free-recall offers.

[4] Exploding offers are special limiting cases of other forms of search deterrence, "buy-now" discounts and deposits. If a deposit or discount is sufficiently high, a buyer will be forced to either accept the offer immediately or reject it entirely. Further, with sufficient return costs, there exist equilibria such that any pricing decision is effectively an exploding offer, because buyers will not return to sellers whose offer they have rejected (Armstrong and Zhou).

[5] See Rao (2016), Soper (2017) and Lavin (2016). Recent trends suggest flash sale websites may be fading from popularity after initial fanfare, while scheduled daily deals are thriving. This is surprising, as there is little distinction between the two methods. We suspect the slight difference in the framing of the two types of sales may be responsible. In our conclusion, we discuss this issue more broadly as a topic for future research.

[6] See patents numbers US 8543470 B2, US 7418405 B1 and US 20100023407 A1 (Grady and Orttung, 2010; 2013; Utter et al., 2008).