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Not all anchors are created equal $\stackrel{\scriptscriptstyle \, \not\! \simeq}{\scriptstyle \ }$

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1. Introduction

There is now a substantial body of experimental evidence supporting the hypothesis that individuals' reported valuations of goods can be affected by *anchors* – that is, non-informative numerical cues (e.g., Ariely, Loewenstein, & Prelec, 2003; Mazar, Koszegi, & Ariely, 2010; Tufano, 2010; Alevy, Landry, & List, 2011; Fudenberg, Levine, & Maniadis, 2012). In a typical experiment, each subject is first asked whether she would buy (or sell) a specific good at a stated price that is clearly arbitrary, and then is asked to state her maximum willingness-to-pay (WTP) or minimum willingness-to-accept (WTA) for that good; the usual finding is that valuations are positively correlated with the arbitrary 'anchor' price. Taken at face value, these findings may have important implications for the efficiency of retail markets, for two reasons. First, if individuals' purchasing decisions can be influenced by irrelevant anchors, firms may be able to use related mechanisms to manipulate those decisions to the detriment of consumers. Second, many policies aimed at ensuring the competitiveness of retail markets rely on consumers' ability to find the lowest prices; the existence of anchoring effects raises doubts about the effectiveness of this mechanism.

However, most of the evidence of anchoring effects on economic valuations has been derived from a narrow class of experimental designs which may not be representative of real-world interactions between firms and consumers. With a

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ABSTRACT

We investigate the effects of a range of different types of anchor on WTP and WTA valuations of familiar consumer products, elicited through individuals' buying or selling decisions at given prices. We find anchoring effects only when the anchor value is framed as a plausible price for the good for which the individual is a potential buyer or seller. Anchoring effects are stronger for WTA than for WTP. We conclude that anchoring effects can affect market behaviour, but that not all anchors are effective.

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few exceptions, these experiments have investigated only one type of anchor, and this type may not be the best model of the opportunities for manipulation that are open to firms. Theory and evidence from psychology suggest that anchoring effects – and hence the scope for failures of price competition – might be much more general than those on which economists have focused. Furthermore, most experiments have used an 'open-ended' method of eliciting valuations which is not typical of retail markets and which may be particularly susceptible to anchoring effects.

In this paper we report an experiment which investigates the effects of a range of different types of anchor on WTP and WTA valuations, elicited through individuals' buying or selling decisions at given prices. A further feature of our experiment is that it allows us to compare the strength of anchoring effects on buyers and sellers. Since consumers act as buyers in most retail markets, differences between the susceptibility of buyers and sellers to anchoring effects are relevant in assessing the impact of these effects on competition and consumer welfare. To date, there have been few such direct comparisons, and these have generated conflicting results.

Section 2 reviews the existing evidence of anchoring effects on economic valuations, drawing attention to some of its limitations. Section 3 identifies four dimensions on which anchors can vary, and discusses theoretical reasons for expecting variation along these dimensions to affect the strength of anchoring effects. Section 4 describes the experimental design we use to investigate these forms of variation. Our results are presented in Section 5. Their implications are discussed in Section 6.

2. Anchoring effects for valuations: existing evidence

The hypothesis that judgements can be subject to anchoring effects was proposed by Slovic and Lichtenstein (1968) as an explanation of 'preference reversal' between choices and relative valuations. It was later used by Tversky and Kahneman (1974) in a more general account of heuristics and biases in judgements under uncertainty. (Viewed in a psychological perspective, valuation is a special case of judgement.) The first direct experimental investigation of anchoring effects on valuations of commodities was by Johnson and Schkade (1989), who studied the effects of anchors on certainty-equivalent valuations of lotteries. That experiment was not incentivized, but in other respects it pioneered what is now the most widely-used experimental design for investigating anchoring effects on valuations.

This *canonical design* has been used in relation to both WTP and WTA; for simplicity, we will describe the WTP version. Each subject first faces an *anchoring task* in which she is asked whether she would buy a specific commodity at a stated price. Usually, this price is fixed by some mechanism that is clearly arbitrary (for example, it is constructed from the digits of the subject's social security number, or set by a random device), but in some experiments the price is simply stated with no explanation of its origin. The subject then faces a *valuation task* which elicits the highest price at which she would buy the same commodity. Usually the elicitation mechanism is *open-ended* (i.e. the subject simply states her highest price), but sometimes it uses *multiple binary choice* (i.e. the subject states whether she would buy at each of a set of alternative prices, and her WTP valuation is inferred from those choices). The valuation task is incentivized, either by the Becker–DeGroot–Marschak (BDM) mechanism or by treating subjects' responses as bids in a Vickrey auction. Usually, but not always, the anchoring task is also incentivized. This design has been used with many different commodities, including stan-dard consumer products, lotteries, sportscards, and unpleasant sounds and tastes (e.g., Ariely et al., 2003; Bateman, Munro, Rhodes, Starmer, & Sugden, 2006; Bergman, Ellingsen, Johannesson, & Svensson, 2010; Mazar et al., 2010; Tufano, 2010; Alevy et al., 2011; Fudenberg et al., 2012). Many but not all implementations of the canonical design have found significant positive relationships between reported valuations and anchor prices (the experiments of Bateman et al., Tufano, and Fudenberg et al. are exceptions).

In a variant design, the anchor is framed as a price expectation. In an experiment reported by Isoni, Brooks, Loomes, and Sugden (2011), the valuation task is incentivized by a median-price Vickrey auction; the anchoring task asks subjects to predict the price that will emerge in this auction, and different questionnaire designs are used to prompt high or low predictions. Mazar et al. (2010) report an experiment in which the anchoring manipulation is to tell subjects the distribution of prices that will be used in the BDM mechanism that incentivizes the valuation task; left-skewed and right-skewed distributions respectively generate low and high price expectations. Both experiments find significant anchoring effects. Anchoring effects induced by the manipulation of price expectations are closely related to *shaping effects* – the tendency for bids and asks in repeated incentive-compatible auctions to be positively correlated with previously-observed prices (Loomes, Starmer, & Sugden, 2003; Tufano, 2010; Isoni et al., 2011).

A few studies have investigated factors which might influence the strength of anchoring effects. It has been found that anchoring effects are weaker for individuals with higher cognitive ability (Bergman et al., 2010) and for individuals with more experience of trading the relevant good (Alevy et al., 2011). Mazar et al. (2010) find that anchoring is stronger when the elicitation method is open-ended than when it uses multiple binary choice. However, there has been little systematic investigation of the relative strength of the effects of different types of anchors on incentivized valuations. Almost all of the existing evidence comes from experiments in which the anchor was a price (or an expectation of a price) for the same commodity that appears in the valuation task, though Ariely et al. (2003, Experiment 5) find that anchor tasks relating to one type of unpleasant noise influence subjects' WTA for experiencing other types. In contrast, psychologists investigating judgement tasks in general have considered many other types of anchor, at least some of which are potentially relevant in economic contexts.

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