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# Buying and selling exchange goods: Loss aversion and the endowment effect

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## Abstract

An experimental market was used to investigate whether exchange goods may be susceptible to the endowment effect. Previous research (Kahneman et al., 1990) suggested that the endowment effect will not be observed in exchange goods. The present study demonstrates that it may be observed, but only when traders are uncertain about future exchange prices. It is argued that this is a manifestation of loss aversion due to the difficulty of computing the net gains and losses of trade when exchange rates are uncertain.

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## 1. Introduction

In the analysis of the bargaining process between potential buyers and sellers of commodities, economic theory assumes that preferences are not affected by ownership. Thus, when income effects and transaction costs are minimal, the willingness to pay for a certain good should equal the willingness to accept. In contrast with these assumptions, however, empirical research shows considerable differences between buying and selling prices of consumption goods (see e.g., Ortona and Scacciati, 1992; Tietz, 1992; Kahneman et al., 1990). Some authors have claimed that these findings may be explained in economic terms. For example, as argued by Knez et al. (1985), strategic considerations may induce buyers to understate, and sellers to overstate their true values. In order to assess whether the observed disparity between buying and selling prices may be due to something other than strategic pricing, one should investigate situations in which buyers and sellers cannot influence the actual trading price with their stated value, a condition we meet in the present study. Even in these circumstances, however, disparities between buying and selling prices have been demonstrated (Kahneman et al., 1990).

The finding that people demand more money as compensation for giving up an object than they are willing to pay in order to obtain the same object is referred to as the 'endowment effect' (Thaler, 1980), and is generally interpreted as a manifestation of 'loss aversion', the generalization that losses are weighted more heavily than gains (Kahneman and Tversky, 1979). A tendency for the disutility of losing an object to exceed the utility of gaining the same object would indeed explain the disparity between selling and buying prices (see also Kahneman et al., 1990; Thaler et al., 1994). This does not mean that the endowment effect will be observed in all goods of a positive value, however. As Kahneman (1992, p. 301) stated: "loss aversion does not affect all transactions. The critical distinction is between goods held for use and goods held for exchange." Kahneman distinguished three categories of exchange goods: (1) money held for spending; (2) goods held specifically for sale; and (3) goods that are only valued because they can be traded ('bargaining chips'). Kahneman concluded that "Loss aversion plays little role in routine economic transactions, in which sellers and buyers trade goods for money, both of which were held for that purpose" (Kahneman, 1992, p. 301).

Why would exchange goods not be susceptible to the endowment effect? What seems crucial is that the value of exchange goods is mainly derived from the monetary value obtained by exchange. According to Kahneman (1992), in

such situations traders may not consider selling the good as a loss (for which they should be compensated) and buying a good as a gain (for which they are willing to pay). Instead, they may compute the *net* gains and losses associated with trading the exchange good (and thus experience no loss aversion). Research on the buying and selling prices of bargaining chips seems to corroborate this reasoning. In two market experiments, Kahneman et al. (1990, Experiments 1 and 5) investigated buying and selling prices for ‘induced-value tokens’ (i.e., bargaining chips that could be exchanged for a certain value). Corroborating Kahneman’s conclusion, buying and selling prices did not differ significantly. It should be noted, however, that in these experiments computing the net gain or loss was relatively simple. The exchange value of the bargaining chip was fixed: buyers and sellers knew beforehand the exchange value of the bargaining chip. Indeed, under such conditions it seems very unlikely that for example sellers being offered \$2.05 for a bargaining chip with an exchange value of \$2.00 will experience loss aversion. They may quite readily realize that trading the chip will provide them a net gain of \$.05. If transaction costs are minimal, sellers may be willing to accept any price that equals or exceeds the fixed exchange price, whereas buyers may be willing to pay any price equal to or lower than the exchange price.

But what if computing the net gain is not that simple? What if exchange prices are not fixed, and traders are not certain how much money they will eventually receive for giving up their exchange good? Will they still evaluate trades in terms of net gains or losses? In essence, selling a good with an uncertain exchange value can be viewed as trading a risky prospect for cash. Do people integrate risky prospects and cash payments in order to compute net gains or losses? Research on Prospect theory and risky decision making suggests they do not: when comparing sure outcomes (e.g., cash) with risky prospects people do experience loss aversion (Kahneman and Tversky, 1979, 1984). This could mean that an endowment effect in buying and selling prices of exchange goods *can* be expected when buyers and sellers are uncertain about future exchange rates. Under these conditions people may experience loss aversion due to the fact that it is more difficult or even impossible to compute net gains of trading cash for uncertain exchange values (see also Kahneman et al., 1990).

In order to investigate the effect of uncertainty of exchange rates on prices, we designed an experimental market in which we compared buying and selling prices of bargaining chips with a fixed value with buying and selling prices of bargaining chips with an uncertain value. In agreement with the findings of Kahneman et al. (1990) we expected no endowment effect in the case of a fixed monetary value. Reasoning that uncertainty may prevent people from evaluating

a trade in terms of net gains/losses, we did expect an endowment effect in the case of an uncertain exchange value.

## **2. Method**

### *2.1. Design and participants*

Sixty-six students (35 females; 31 males; mean age: 21 years) of Leiden University participated in the experiment. Position (buyer vs. seller) and Uncertainty (fixed exchange value vs. uncertain exchange value) were manipulated in a  $2 \times 2$  factorial design. Participants were randomly assigned to conditions, and paid for their participation.

### *2.2. Procedure*

The participants were invited to the laboratory in groups of up to eight people. Upon arrival, half of the participants received a bargaining chip. The bargaining chips were said to represent money since they could be exchanged for money at the end of the experiment. In the Fixed Exchange Value conditions, participants learned they could exchange the chip with the experimenter for Dfl. 3.50 (1 Dutch Guilder  $\approx$  \$.55 US). In the Uncertain Exchange Value conditions, participants learned they could exchange the chip for an amount of money between Dfl. 1.75 and Dfl. 5.25, depending on a chance procedure.

Before exchanging the bargaining chip for money with the experimenter, however, participants could trade the bargaining chips among themselves: participants owning a chip (the Sellers) could sell this chip to participants not owning a chip (the Buyers). The procedure for indicating buying and selling prices resembled the procedure used by Kahneman et al. (1990). On a separate form, prices were listed from Dfl. 0.25 to Dfl. 6.75 (with Dfl. 0.25 intervals). Sellers were requested to indicate for each price whether or not they would sell at that price. Buyers indicated for each price whether or not they would buy at that price. The experimenter would randomly select a price on this form, thus establishing the 'market price' for the chip. This procedure was intended to prevent participants from misstating their true values. It was stressed that if they had indicated that they were willing to buy/sell at this randomly selected 'market price', they had to stick to their stated intention. With this procedure we also attempted to diminish the possible effect of demand characteristics, which may affect choice behavior in experimental markets. After the experimenter

collected the forms, participants estimated the value of the bargaining chip. At this point the experiment was ended. Participants were debriefed and all received Dfl. 5.00. All participants agreed to this procedure.

### 3. Results

#### 3.1. Offers

A  $2 \times 2$  ANOVA on the offers (i.e., the selling price of the sellers and the buying price of the buyers) revealed a Position main effect ( $F(1,62) = 12.8$ ,  $p < 0.001$ ), indicating an endowment effect: The selling price of the sellers (mean = Dfl. 3.76) exceeded the buying price of the buyers (mean = Dfl. 3.05). As predicted, this main effect was qualified by a significant Position  $\times$  Uncertainty interaction ( $F(1,62) = 4.1$ ,  $p < 0.05$ ). Corroborating the findings of Kahneman et al. (1990), no significant endowment effect was observed when the value of the exchange good was fixed ( $F(1,62) = 1.2$ ,  $p < 0.3$ ; overall mean = Dfl. 3.40; mean for sellers = Dfl. 3.56; mean for buyers = Dfl. 3.25). In agreement with our hypothesis, in the case of an uncertain exchange rate, however, the selling price (mean = Dfl. 3.97) significantly exceeded the buying price (mean = Dfl. 2.87;  $F(1,62) = 15.7$ ,  $p < 0.0001$ ). These results indicate that exchange goods may, like consumption goods, be susceptible to the endowment effect, provided that exchange rates are uncertain.

#### 3.2. Expected exchange value

Research in experimental markets suggests that value judgments and prices may be affected by uncertainty (for an excellent overview on this subject see Camerer, 1992). In order to assess whether estimates of the exchange value were affected by ownership and/or uncertainty, we asked participants to indicate the monetary value they expected to receive for the bargaining chip (i.e., the value for which it could eventually be exchanged with the experimenter). Not surprisingly, in the fixed value conditions, both buyers and sellers (correctly) estimated the exchange value to be Dfl. 3.50. Of course we were more interested in the estimates of buyers and sellers in the case of the uncertain exchange value. In the Uncertain Exchange Value conditions buyers' and sellers' estimates did not significantly differ from Dfl. 3.50 (mean for buyers = Dfl. 3.34;  $t(16) = 0.9$ ,  $p < 0.4$ ; mean for sellers = Dfl. 3.27;  $t(15) = 1.5$ ,  $p < 0.2$ ). More interestingly, these results indicate that even in these Uncertain Exchange Value conditions buyers and sellers did not differ in their estimates ( $t(31) = 0.3$ ,  $p < 0.8$ ).

Thus, uncertainty of exchange rates did affect buying and selling prices (i.e., uncertain exchange rates resulted in an endowment effect), but did not affect the value estimates of buyers and sellers. This is in line with the suggestion that the endowment effect is primarily the result of loss aversion: sellers did not expect a higher exchange value than buyers, they just demanded more money for giving it up than buyers were willing to pay.

#### 4. Conclusions

Taken together, the results of the present study confirm the proposition (cf. Thaler, 1980; Thaler et al., 1994; Kahneman, 1992; Kahneman et al., 1990) that the endowment effect is a result of loss aversion. While corroborating this proposition, the data do qualify Kahneman's (1992) conclusion that exchange goods are not susceptible to the endowment effect. Our interpretation of the data is that an endowment effect may be observed in exchange goods when exchange rates are uncertain, because people are less likely or able to compute the net gains (cf. Kahneman and Tversky, 1984).

One other thing that uncertainty may do is elicit a motivation to avoid regret. Could this explain the results of our present study? One of the basic assumptions of the Loomes and Sugden (1982) Regret theory is that people may anticipate feelings of regret. This notion on its own falls short of explaining the endowment effect, however. Anticipation of regret does not necessarily imply an unwillingness to buy or sell. People may also experience regret after not buying or not selling. For example, in our experiment people may eventually regret buying a chip for Dfl. 3.50 when the exchange rate turns out to be only Dfl. 1.75. They may also regret *not* buying a chip for Dfl. 3.50 when the exchange rate turns out to be Dfl. 5.25. Similarly, people may not only regret selling a chip for Dfl. 3.50 when the exchange rate turns out to be Dfl. 5.25, they may also regret *not* selling a chip for Dfl. 3.50 when the exchange rate is Dfl. 1.75.

It is also appropriate to note that we do not claim that all disparities between buying and selling prices are necessarily the result of loss aversion. Beggan (1992) argued that people may overvalue objects they own in order to maintain a positive self-image. In agreement with this interpretation, he demonstrated that in many situations ownership may produce greater liking for an owned object. In a similar vein, Ortona and Scacciati (1992) argued that the endowment effect may be related to an 'instinctive bias' due to ownership. These interpretations would imply a general overvaluation of objects owned, whereas we did not observe an endowment effect in the case of fixed exchange rates. General

overvaluation of objects owned may be more prevalent in the case of consumer goods than in the case of exchange goods, however. Beggan's (1992) analysis of the mere ownership effect presupposes that "possessions are objects associated with the self" (Beggan, 1992, p. 229). In our experiment (i.e., a study on exchange goods) participants may not have experienced such an association because they realized that at the end of the experiment the bargaining chips would be exchanged for money.

Although the main focus of our study was on the question whether an endowment effect may be observed in the trade of exchange goods, it may be worthwhile to elaborate on the possible implications for research on consumption goods. The bulk of the research on the endowment effect has been on consumption goods (e.g., mugs, chocolate bars) in situations where it may be difficult to compute the net gains and losses of trade. If someone wants to buy your chocolate bar you may perceive giving up the chocolate bar as a loss. But what would happen if someone offered you one and a half chocolate bars for your chocolate bar? In this situation it is easy to compute the net gains of trade (you would gain half a chocolate bar), and you would probably not be susceptible to the endowment effect. This tentative example suggests that to predict whether sellers and buyers will experience loss aversion, research should not only focus on what is being traded (e.g., exchange goods or consumption goods). Instead, research should also focus on *what is being traded for what*. It may be worthwhile to relate these insights to the characteristics approach of Lancaster (1971). In his theory of consumer demand Lancaster viewed goods as bundles of characteristics. One of the propositions of this theory is that goods will be more substitutable the more characteristics they have in common. In a similar vein, we suggest that people will be less subject to the endowment effect the more characteristics the objects traded have in common; in such situations it may be more easy to compute the net gains and losses of trade. It seems appropriate to investigate the relation between substitutability and the endowment effect in future research by comparing the willingness to trade for goods varying in the number of common characteristics.

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