SHORT-SELLING AND THE WTA-WTP GAP

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Abstract

The experimental results of the current paper reveal positive relations between short-selling bidding prices and the WTA-WTP gap. This result may be explained by the status-quo bias.

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1 Introduction

The current paper examines short-selling biding prices and relates these prices to the WTA-WTP gap and to some behavioral effects. Short-selling an asset in finance means to borrow and sell the asset in the current market price, promising to buy it back at a later date (hopefully at a lower market price) and return it to the lender. In our experiment, we give the individual the choice to sell an asset (lottery) short by bidding the minimum price this individual is willing to accept in order to make a commitment to pay the asset's outcome (future price after realization of the lottery).

Several experimental studies have examined the short-selling position for lottery tickets. Eisenberger and Weber (1995) used the Becker, DeGroot, and Marschak (1964) (BDM) procedure to elicit buying, selling, short-selling, and short-buying prices. Their results indicate that subjects clearly distinguish between risky and ambiguous lotteries and understand the different ways in which lotteries are framed. Several other experimental works deal with trading in group experiments and show the relevance of short-selling constraints (e.g., King et al., 1993; Ackert et al., 2002; Haruvy and Noussair, 2006; Fellner and Theissen, 2006).

Some other studies have suggested a relation between behavioral biases and short-selling. For example, Scheinkman and Xiong (2003) proposed a model of asset trading based on short-selling constraints and heterogeneous beliefs generated by agent overconfidence. In the current paper, we also relate the short-selling bidding pattern to behavioral biases, such as the status-quo bias (e.g., Samuelson and Zeckhauser, 1988). In particular, we experimentally examine the relation between the WTA-WTP gap and subjects' short-selling bidding pattern. We asked subjects in second-price auctions (Vickery 1961) to bid the prices for buying (WTP), selling (WTA), and short-selling (WTAS) of different lottery tickets.

The disparity between willingness to pay (WTP) and willingness to accept (WTA) has been demonstrated repeatedly in many experiments (e.g., Kahneman et al., 1990; Thaler et al., 1992, Horowitz & McConnell, 2002). In the context of lotteries, Kachelmeier and Shehata (1992) confirmed the endowment effect, which has an impact on the bidding pattern of individuals. Yet, recent studies have questioned the existence and interpretation of the WTA-WTP gap (Shogren et al. 2001, Plott and Zeiler, 2005). List (2003) found that the endowment effect can be eliminated by market experience. His results from field auctions for sportscards indicate that offers and bids are significantly different for naive consumers, but statistically indistinguishable for experienced consumers.

The WTA-WTP gap has been linked to the status-quo bias (Samuelson and Zeckhauser, 1988). Studies have demonstrated that people are reluctant to make changes in their current state and to trade objects they own. Most of the experimental studies that find WTA-WTP gaps provide support for the status-quo bias, (e.g., Kahneman, et al., 1990, 1991; Thaler et al., 1992, and Hartman, et al., 1991). In addition, status-quo effects for risky choices were found by Shogren et al. (1994).

In the current paper we show how subjects' short-selling (WTAS) bidding patterns are related to the status-quo bias.

The paper is organized as follows. Section 2 presents the hypotheses of the study. Section 3 describes the experimental procedure, and Section 4 presents the results. Finally, Section 5 summarizes and concludes.

2   Hypotheses

The endowment effect explanation for the WTA-WTP gap emphasizes the feeling of ownership that subjects have when they ask a higher price for an asset they own than the price they offer for buying the same asset. The status-quo bias explanation emphasizes people's willingness to remain in their current position when asking a higher price for selling an asset they own than for buying the same asset.

According to the last explanation, the status-quo bias increases the WTA-WTP gap and in addition increases the short-selling bid (WTAS). Therefore, we expect to find a positive relation between WTAS and the WTA-WTP gap. In order to test this hypothesis, we used an experimental evolution of lotteries, as described in the following section.

3   The Experimental Method

The participants in the experiment were 51 undergraduate students of economics[1]. The experiment took place in a computerized lab and lasted approximately half an hour. Subjects were asked to bid prices for buying, selling and short-selling of different lotteries in a second-price auction (SPA)[2] (see examples in Appendix A). Subjects were given written instructions[3] telling them that in the case of a buying/selling auction, the subject with the *highest/lowest* bidding price will win the auction, but will pay the *second highest/lowest* bidding price in the group

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[1] The students were from Ben-Gurion University.

[2] The Vickery Auction is used to elicit truthful revelation of values in laboratory experiments (e.g., Cousey et. al, 1987).

[3] Translated version will be provided upon request.

participating in the auction. The auctions were presented in a random order to avoid any order effect.

In each auction, subjects received an initial balance and were told that at the end of the experiment, they would be randomly divided by a computer program into groups of five and would compete on buying lotteries, selling lotteries and selling obligations to pay lottery outcomes, using SPA.

All subjects were told that one of the problems would be randomly selected (at the end of the experiment) and that they would be paid 10% (in N.I.S.) of their final balance in the selected problem[4]. The assets are described as follows:

<Insert Table 1 about here>

All assets were presented in three positions: buying, selling and short-selling**.**

4   Results

A separate regression was run for each lottery according to the following equation:

$$WTAS = \alpha + \beta \ (WTA\text{-}WTP) \qquad (1)$$

Table 2 presents the results for equation 1 for each lottery.

<Insert Table 2 about here>

We found that β, the coefficient of (WTA-WTP) in the regression analysis, was positive and significant for all the lotteries. Therefore, the results confirm our hypothesis that for all the lotteries the WTAS of an individual is positively related to his or her WTA-WTP gap.

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[4] The average payment was 20 N.I.S. (approximately 4.5 US$).

The WTA-WTP gap can be viewed as a measure of the status-quo bias, since an individual who owns an asset (long position) requires "a status- quo compensation" to move to a lower or zero position. Similarly, the individual requires related compensation for moving from the zero position to a short position. This "status-quo compensation" has an impact on the willingness to sell short (WTAS).

The fact that the constant (α) in equation (1) does not differ from 1 (except for special lottery E) indicates that the status-quo compensation for short-sell is added to the mean value of the lottery.

5 Discussion

The current paper reveals the relation between short-selling bidding price and the WTA-WTP gap. The results indicate that the short-selling asking price (WTAS) is positively related to the WTA-WTP gap, thus confirming our hypothesis.

Our behavioral analysis shows that the bidding pattern of individuals is very much related to their reference point. A possible explanation for these results may be the status-quo bias, which is one of the common explanations for a positive WTA-WTP gap. Individuals with status-quo bias offer a high short-selling price (WTAS) in order to maintain their current position (status-quo) without the lottery obligation.

Since individuals differ in their WTA-WTP gap, they also differ in their bids for short-selling. Therefore, in the markets we will observe heterogeneous behavior, which includes short-selling by those individual with lower status-quo bias and of course with different expectation regarding the return on the asset. In addition, people with a higher WTA-WTP gap will require higher compensation for short-selling, which in turn, will have a negative effect on investors' liquid assets. These results are

important for better understanding the patterns of short-selling bidding prices, which are especially significant in financial markets. Moreover, in real markets short-selling is normally used by experienced traders. Hence, the findings of List (2003) that the endowment effect is reduced for experienced traders may lead to a conjecture that experienced traders in a market that specializes in short-selling will show lower WTAS, according to equation (1).

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Tables

Table 1: <u>Main Assets Description</u>

	Probabilities and Values			
Asset/Probabilities	**30%**	**40%**	**30%**	**Expected Value**
Lottery A	100	60	20	*60*

	Probabilities and Values			
Asset/Probabilities	**40%**	**40%**	**20%**	**Expected Value**
Lottery B	150	80	20	*96*
Lottery C	15	8	2	*9.6*
Lottery D	160	100	-40	*96*

	Probabilities and Values			
Asset/Probabilities	**5%**	**75%**	**20%**	**Expected Value**
Lottery E	640	80	20	*96*

Asset	α	β	R-Square
Lottery A	1.06 (0.00)	0.37 (0.03)	0.09 (0.03)
Lottery B	0.97 (0.00)	0.62 (0.00)	0.39 (0.00)
Lottery C	0.98 (0.00)	0.25 (0.03)	0.1(0.03)
Lottery D	**0.99 (0.00)**	**0.30 (0.00)**	**0.37 (0.00)**
Lottery E	1.53 (0.00)	0.57 (0.00)	0.29 (0.00)

* WTAS = α + β(WTA-WTP)

** Significant level in brackets

Appendix A

- **(1) _Buying a Lottery (WTP)_**

  Your initial balance is 100 N.I.S.

  What is the maximum price you are willing to pay for buying the following

  lottery ticket?

Probability	Payoff
30%	100
40%	60
30%	20

(2) _Short selling (WTAS)_

Your initial balance is 100 N.I.S.

What is the minimum price you are willing to receive in order to make a commitment

to pay the following lottery's outcome?

Probability	Payoff
30%	100
40%	60
30%	20

(3) _Selling a Lottery You Own._

Your initial balance is 100 N.I.S. In addition, you own the following lottery ticket:

Probability	Payoff
30%	100
40%	60
30%	20

What is the minimum price you are willing to receive for selling this lottery ticket?