The disposition effect and investor experience

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Abstract We examine whether investing experience can dampen the disposition effect, that is, the fact that investors seem to hold on to their losing stocks to a greater extent than they hold on to their winning stocks. To do so, we devise a computer program that simulates the stock market. We use the program in an experiment with two groups of subjects, namely experienced investors and undergraduate students (the inexperienced investors). As a control procedure, we consider random trade decisions made by robot subjects. We find that though both human subjects show the disposition effect, the more experienced investors are less affected.

1. Introduction

The disposition effect is the anomaly that investors seem to hold on to their losing stocks to a greater extent than they hold on to their winning stocks (Schiarbaum et al., 1978; Shefrin and Statman, 1985; Weber and Camerer, 1998). For instance, data from a consulting retail brokerage house revealed that stocks with positive returns were 68% more likely to be sold than those with negative returns (Odean, 1998). The disposition effect is lessened if there is financial counseling (Taylor, 2000; Shapira and Venezia, 2001), and it is heightened for inexperienced investors (Grinblatt and Keloharju, 2001; Coval and Shumway, 2005; Feng and Seasholes, 2005; Locke and Mann, 2005; Dhar and Zhu, 2006), though that is still unsettled (Chen et al., 2007). Here, we investigate the relationship between the disposition effect and investing experience using a “framed field experiment” (Harrison and List, 2004).

Tests proving the disposition effect in actual markets (such as those in the works above) cannot be conclusive because investor decisions cannot be controlled in there. For that reason, lab experiments can be more illuminating in that they can be designed to match individual investors’ trading decisions with the prices at which they buy or sell stocks. In stark contrast with the above studies using actual data, when it comes to the lab the disposition effect may be even higher for experienced investors (like in the “artefactual field experiments” of Haigh and List (2005) and of Abbink and Rockenbach (2006)). That can be explained by either the curse of knowledge (“the more you know, the worse you become at using that knowledge”) (Camerer et al., 1989), the desire to avoid regret (Barber and Odean, 1999), or simply by the fact that an experiment is too simplistic.

Because it is possible that the relationship between the disposition effect and investing experience can be dependent on experiment design, here we try to remedy such a deficiency by developing a computer program that mimics the stock market while retaining the characteristic that investor decisions cannot influence the (exogenous) stock prices. We use the program in an experiment with two groups of subjects, namely experienced investors and undergraduate students (the inexperienced investors). As a control procedure, we also consider random trade decisions made by robot subjects. We thus set a more complex experimental environment than does a typical experiment while preserving the control characteristics that are the edge of the experimental method. As a result, we find the disposition effect in human subjects, and also that experienced investors are less prone to the effect, which is in line with most of the evidence discussed above for actual data.

Harrison and List (2004) put forward the following taxonomy to classify experiments: (1) conventional lab experiment; (2) artefac-
tual field experiment; (3) framed field experiment; and (4) natural field experiment. As observed, ours is a framed field experiment, which is also an artefactual field experiment but with field context in the task and information set used by the subjects.

Table 1 presents the main results of selected recent work related to the disposition effect and investor experience. The rest of this paper is organized as follows. Section 2 presents the three measures of the disposition effect employed in this work, Section 3 details the design of the experiment, Section 4 presents the characteristics of the subjects participating in the experiment, Section 5 reports results, and Section 6 concludes the study. A sensitivity analysis of the results is presented in an Appendix.

2. Measures of the disposition effect

Experimental studies typically track the disposition effect whenever subjects sell more (less) stocks as the sale price is above (below) either the purchasing price or the previous price (Weber and Camerer, 1998). However, such a measure can be misleading in the presence of bull–bear market cycles. For instance, in a bull market a stock sold is more likely to be a winner. Here investors might rationally think that rising prices will tend to persist in future, thereby making sense to sell winners (Da Costa et al., 2008). Since our experiment is run in an artificial market we consider the measure of the disposition effect commonly used in real-world markets (Odean, 1998) that is able to take market cycles into account. However, Odean’s measure is not without problems, as discussed below. For that reason, we also assess the disposition effect in our experiment by two other measures: that of Weber and Camerer (1998), which considers the difference between the number of trades with realized gains by investor i and the number of trades with realized losses relative to the number of all trades, that is,

\[ DE_i = \frac{N_{i}^{g} - N_{i}^{l}}{N_{i}^{g} + N_{i}^{l}} \]  

(5)

where \(-1 \leq DE_i \leq 1\). If the number of trades with realized gains matches the number of trades with realized losses there is no disposition effect. The other measure is that of Dhar and Zhu (2006):

\[ DE_i = \frac{N_{i}^{g}}{N_{i}^{g} + N_{i}^{l}} \]  

(6)

3. Experiment design

To run our experiment we employ the computer program that simulates the stock market called Simulabolsa, which was developed by one of us (J.M.). Fig. 1 shows the program’s main menu. The program generates an individual report for the disposition effect that are sensitive to portfolio size and trading frequency. Our approach is that of Odean (1998), which considers the number of trades with realized gains by investor i and the number of trades with realized losses relative to the number of all trades, that is,

\[ DE_i = \frac{N_{i}^{g} - N_{i}^{l}}{N_{i}^{g} + N_{i}^{l}} \]  

(5)

where \(-1 \leq DE_i \leq 1\). A positive value of \( DE_i \) indicates that a smaller proportion of losers is sold if compared with the proportion of winners sold, in which case investor i exhibits the disposition effect.

The definition in Eq. (2) can be evaluated by the t-statistic

\[ t = \frac{\text{PGR}_i - \text{PLR}_i}{SE_i} \]  

(3)

where the standard error \( SE_i \) is

\[ SE_i = \sqrt{ \frac{\text{PGR}_i(1 - \text{PGR}_i)}{N_{i}^{g} + N_{i}^{l}} + \frac{\text{PLR}_i(1 - \text{PLR}_i)}{N_{i}^{g} + N_{i}^{l}} } \]  

(4)

One disadvantage of Eq. (2) is that the PGR and PLR measures are sensitive to portfolio size and trading frequency. The first one is precisely the measure of Weber and Camerer (1998), which considers the difference between the number of trades with realized gains by investor i and the number of trades with realized losses relative to the number of all trades, that is,
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