The disposition effect and investor experience

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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 (Scharbaum 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 Seaholes, 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 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.

Table 1 Selected recent work related to the disposition effect and investor experience.

<table>
<thead>
<tr>
<th>Author</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menkhoff and Nikiforow (2009)</td>
<td>Fund managers who have strong incentives to learn efficient behavior and who do not endorse the behavioral finance view, end up failing to learn, thus suggesting that many behavioral finance patterns are rooted in human behavior and difficult to be overcome by learning</td>
</tr>
<tr>
<td>Chang (2008)</td>
<td>Evidence of the disposition effect in investors of the Taiwanese warrant markets</td>
</tr>
<tr>
<td>Kliger and Kudryavtsev (2008)</td>
<td>The reference point updating process of the disposition effect is more reactive to events when information flow is low and prices are sensitive to market fluctuations. Agents facing numerous alternatives consider those that have caught their attention</td>
</tr>
<tr>
<td>Lee et al. (2008)</td>
<td>Evidence of the disposition effect in internet-based stock trading</td>
</tr>
<tr>
<td>Goetzmann and Massa (2008)</td>
<td>A panel of individual investor trading records shows that exposure to a portfolio of stocks held by disposition-prone investors explains cross-sectional differences in daily returns</td>
</tr>
<tr>
<td>Hales (2007)</td>
<td>Investors are motivated to agree unthinkingly with information that suggests they might make money on their investment, but disagree with information that suggests they might lose money</td>
</tr>
<tr>
<td>Hedesstrom et al. (2007)</td>
<td>In an internet-based survey of fictitious choices among fund categories, home bias and a diversification heuristic were unaffected by previous stock market investment experience</td>
</tr>
<tr>
<td>Garvey and Murphy (2004)</td>
<td>Data on a US proprietary stock-trading team provide evidence of disposition effect</td>
</tr>
</tbody>
</table>

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

\[ t = \frac{PGR_i - PLR_i}{SE_i} \]  

where the standard error \( SE_i \) is

\[ SE_i = \sqrt{\frac{PGR_i(1-PGR_i)}{N_{gp}^i + N_{lp}^i} + \frac{PLR_i(1-PLR_i)}{N_{gp}^i + N_{lp}^i}} \]  

One disadvantage of Eq. (2) is that the \( PGR \) and \( PLR \) measures are sensitive to portfolio size and trading frequency (Odean, 1998). They are likely to be smaller for investors who hold larger portfolios and trade frequently because those portfolios contain a larger number of stocks with capital gains and capital losses. This problem gets more serious as the measures are employed in cross-sectional analyses.

Thus we also employ two other measures of the disposition effect that are not 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,

\[ DE_i = \frac{N_{gp}^i - N_{lp}^i}{N_{gp}^i + N_{lp}^i} \]  

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):

\[ DE_i = \frac{N_{gp}^i}{N_{gp}^i + N_{lp}^i} - \frac{N_{lp}^i}{N_{gp}^i + N_{lp}^i} \]

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 all the decisions made by the subjects throughout the simulation period. The output can thus allow one to get informed about variables, such as the number of stocks bought and sold each period, and individual portfolio composition at the end of a period.

The program was fed with actual data for stock prices taken from the Sao Paulo stock exchange (Bovespa) for the 5-year period from January 1997 to December 2001. The program also included...
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