The disposition effect and investor experience

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❖ Objectives and motivations of the study :

Here, we examine whether investing experience can dampen the disposition effect, that is the fact that investors seem to hold on their losing stocks to a greater extent than they hold on their winning stocks.
We investigate the relationship between the disposition effect and investing experience using a « framed field experiment ».

❖ Used data :

The main datatset is two groups of subjects :

- Namely experienced investors : Stock investors with a minimum of 2 years of experience were sampled from consulting retail brokerage houses located in Florianopolis, Brazil. From the 26 subjects that ended up participating in the experiment, 9 reported more than 5 years of experience, while 17 reported from 2 to 5 years.

- Undergraduate students (the inexperienced investors) were sampled from economics and business administration of the Federal University of Santa Catarina also located in Florianopolis. A total 38 student subjects participated.

Dataset and results from several studies such as : Weber and Camerer, 1998 ; Odean 1998 … (Page 7)

The program was fed with actual data for stock prices taken from the Sao Paulo stock exchange for the 5-year period from January 1997 to December 2001. Indicators used in the program are based on fundamental analysis taken from Economatica.

❖ Indicators / Méthods / Models used :

Test proving the disposition effect in actual markets cannot be conclusive because investor decisions cannot be controlled in there. For that reason, they created the following method in order to find if there is a relationship between the disposition effect and investing experience.

Methods used :

#0 : They created a computer program that mimics the stock market while retaining the characteristic that investor decisions cannot influence the stock prices. This program is used on the dataset describe in the previous section.

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.

#1 : Measures of the disposition effect :

- **(Eq2)** Odean's measure (sensitive to portfolio size and trading frequency) considers the actual and potential trades of investor i during a sample period. Potential trades refer to stocks in a portfolio that were not sold but that could have been either winners or losers. The proportion of gains realized (PGRi) and proportion of lossed realised (PLRi) are computed as :

$$PGR_i = \frac{N^i_{gr}}{N^i_{gr} + N^i_{gp}}, \quad PLR_i = \frac{N^i_{lr}}{N^i_{lr} + N^i_{lp}}$$

Where Ngr(i) (Ntr(i)) is the number of trades by investor i with a realized gain (loss), and Ngp(i) (Nlp(i)) is the number of portential trades for investor i with a gain (loss).

The disposition effect (DE) of inverstor i is then : $DE_i = PGR_i - PLR_i$

- **(Eq5)** The measure of Weber and Camerer (1998) (not sensitive to portfolio size and trading frequency), wich 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 :

$$DE_i = \frac{N^i_{gr} - N^i_{lr}}{N^i_{gr} + N^i_{lr}}$$

- **(Eq6)** The other measure is that of Dhar and Zhu (2006) :

$$DE_i = \frac{N^i_{gr}}{N^i_{lr}} - \frac{N^i_{gp}}{N^i_{lp}}$$

In each case, -1<< DEi << 1. A positive value of DEi indicates that a smaller proportion of losers is sold if compared with the proportion of winners sold, in wich case investor i echibits the disposition effect. If the number of trades with realized gains matches the number of trades with realized loss there is no disposition effect.

- Simple and multiple linear regression between the disposition effect and investing experience.

❖ Robustness Checks :

As a control procedure, we also consider a random trade decisions made by robot subjects. We thus set a more complex experimental encironment than does a typical experiment while preserving the control characteristics that are the edge of the experimental method. (And many Sensitvity Analysis)

❖ Results :

- DE with **(Eq2)**

Table 3
The disposition effect for the groups of subjects using Eq. (2).

Subject	Group of investors	Group of students	Both human groups	Group of robots
N_{gr}	346	693	1039	544
N_{lr}	179	314	493	581
N_{gp}	1434	2239	3673	3894
N_{lp}	1265	2085	3350	3845
PGR	0.1944	0.2364	0.2205	0.1280
PLR	0.1240	0.1309	0.1283	0.1317
DE	0.0704	0.1055	0.0922	−0.0037
SE	0.0127	0.0104	0.0081	0.0071
t-Statistic	5.51***	10.10***	11.38***	−0.52

* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

Table 4
The disposition effect for individual subjects using Eq. (2).

Subject	Investors	Students	All human subjects	Robots
Number of subjects	26	38	64	50
Mean	0.0790	0.0913	0.0863	−0.0100
Median	0.0739	0.0848	0.0814	−0.0072
Maximum	0.4093	0.4198	0.4198	0.1018
Minimum	−0.2232	−0.4371	−0.4371	−0.1891
Standard deviation	0.1562	0.1724	0.1649	0.0610
Jarque–Bera	0.35	4.69	3.39	7.63**
t-Statistic (mean = 0)	2.57**	3.26***	4.19***	−1.15
Wilcoxon *Z*-statistic (median = 0)	2.18**	3.21***	3.93***	0.74
Subjects with *DE* > 0 (%)	69.2	76.3	73.4	48

* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

As can be seen in Table 3, though both human groups exhibited the disposition effect, the effect was lessened for experienced investors. The robots did not show the disposition effect, taht suggesting that the common explanation by some type of human cognitive bias make sense.

- DE with **(Eq5,6) :**

Table 5
The disposition effect for individual subjects using Eq. (5).

Subject	Investors	Students	All human subjects	Robots
Number of subjects	26	38	64	50
Mean	0.2916	0.3708	0.3386	−0.0155
Median	0.3968	0.3333	0.3333	−0.0238
Maximum	0.8182	0.8889	0.8889	0.5000
Minimum	−0.5000	−0.2727	−0.5000	−0.5238
Standard deviation	0.3502	0.2890	0.3150	0.2650
Jarque–Bera	1.13	0.32	1.39	1.17
t-Statistic (mean = 0)	4.25***	7.91***	8.60***	−0.41
Wilcoxon *Z*-statistic (median = 0)	3.34***	4.90***	5.93***	0.28
Subjects with $DE > 0$ (%)	80.8	89.5	85.9	42

* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

Table 6
The disposition effect for individual subjects using Eq. (6).

Subject	Investors	Students	All human subjects	Robots
Number of subjects	26	38	64	50
Mean	1.4165	1.8919	1.6888	0.0410
Median	1.0179	1.1016	1.1016	−0.0290
Maximum	9.6923	15.0952	15.0952	2.1935
Minimum	−3.1310	−8.5417	−8.5417	−0.7679
Standard deviation	2.9427	4.4986	3.9217	0.6000
Jarque–Bera	5.64	13.05***	33.34***	21.80***
t-Statistic (mean = 0)	2.45**	2.59**	3.45***	0.48
Wilcoxon *Z*-statistic (median = 0)	2.08**	3.21***	3.76***	0.12
Subjects with $DE > 0$ (%)	69.2	76.3	73.4	48

* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

Yes the effect is overall significant at 1% in Table 5. Apart from the investors in the definition (6) in table 6, the Jarque-Bera could not reject the normality hypothesis. For the robots, the hypothesis could be rejected vut such subjects did not exhibit the disposition effect, as seen.

- Regression :

To investigate the influence of experience on the disposition effect, we first run a simple linear regression between the disposition effect and investing experience. Then to remedy a shortcoming, we run the following multiple regression :

$$DE_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \mu_i \qquad (8)$$

where $X_{1i} = 1$ is the dummy for subjects with 2–5 years of experience ($X_{1i} = 0$ otherwise), and $X_{2i} = 1$ is the dummy for subjects with more than 5 years of experience ($X_{2i} = 0$ otherwise).

This study shows that the disposition effect tends to be reduced for subjects with more than 5 years in stock markets.

❖ Conclusion :

Does investor experience dampen the disposition effect ? Most studies using actual data answer « yes ». However, this answer conflicts with the results found in lab experiment. Tests proving the disposition effect in actual makets cannot be conclusive because inverstor decisions cannot be controlled in there.

In this study we find that the disposition effect is reduced if investors have more than 5 years of experience in stock markets.