

# **Hedging Against Embarrassment**

by

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**Forthcoming on the *Journal of Economic Behavior and Organization***

**April 2015**

## **Abstract**

This paper assesses the extent to which the expected disclosure to peers of an individual investor's financial performance influences his/her stock-trading decisions. In a lab experiment, participants trade in incentivized stock market simulations, knowing that their financial performance will be either made public or kept private. The results show a significant increase in the disposition effect when financial performance is to be made public, resulting from a spike in the realization of gains. We conclude by suggesting that this phenomenon may be due to individuals' strategic attempt to hedge against the embarrassment of ending the trading session at the bottom of the performance ranking.

## 1. Introduction

In a Wall Street asset management company, a regular meeting is conducted in order to evaluate the financial performance of its various fund managers. During the meeting, managers who had the worst performance over the past months are asked to come forward and explain to colleagues and to senior managers why they failed to achieve a good performance. An experienced fund manager, John, is concerned about being among the worst performers, which will force him to come forward in the next meeting. To minimize the risk of this unpleasant experience, John wonders about adopting an investment strategy that could avoid putting him in the bottom group.

The previous scenario illustrates the potential influence of social comparisons and, in particular, the role played by the disclosure of an individual investor's financial performance in determining investment decisions. Recent evidence suggests that, in fact, social comparisons play a major role in the way individuals make investment decisions (Linde and Sonnemans 2012). In the previously described "fund manager" example, two questions arise: if John knows that his performance will be revealed to his peers at a later point in time, will he behave differently in the trading sessions relative to a scenario in which his performance is expected to remain private? If so, how would the expected disclosure of his performance impact his investment decisions?

In this paper we assess a yet unexplored route in the field: *whether*, and if so, *how* the expected disclosure to peers (vs. privacy) of individual investors' financial performance influences one of the most prevalent anomalies in behavioral finance, the disposition effect—that is, investors' higher propensity to sell the stocks that have increased (vs. decreased) in value relative to the purchase price (Odean 1998, Shefrin and Statman 1985, Weber and Camerer 1998).

The expected disclosure of investment outcomes can be of relevance to both individual and professional investors. Professional traders and asset managers, for example, have their respective performances made public in various settings, such as bonus payments and the disclosure of managed-funds' performance. In fact, internal public disclosure of employees' performances is often used for the incentive purposes (Endlich, 2000; Derman, 2004). In his biography, *My Life as a Quant*, the famous physicist and later financial expert Emanuel Derman describes how annual bonus payment used to work during his time as an employee at the investment bank Goldman Sachs. At that time, the payroll system was unable to cut a check for more than \$100,000 US dollars. If an employee's year-end bonus was, for example, \$1,000,000, then he would receive ten checks, each one sealed in its own envelope, with the whole bundle neatly stacked and secured by a rubber band. "Thus, although bonus amounts were private, and you were encouraged to keep them that way, you could guess the order of magnitude of someone's bonus by the thickness of their deck of checks. Even a mini-bundle of two checks was instantaneously distinguishable from one. Some traders received a fat stack and some of them flaunted it. One well-paid young trader had a habit of taking his bundle and silently riffling through it, meticulously counting the envelopes one at a time in full view of his colleagues." (Derman, 2004 p. 185).

To test whether and how the expected disclosure to peers (vs. privacy) of individual investors' financial performance influences the disposition effect (hereafter DE), we conducted a lab experiment in which undergraduate students participated in a simulated trading session. Participants were either told that their performance in the simulation would be made public (vs. kept private). They then played the simulation, revealed, or did not, their performances to others, and were paid according to their final earnings. The findings show that participants made different financial decisions in the stock market simulation when they expected their performance to be made public compared to the situation in which they expected their

performance to be kept private. Precisely, the disposition effect increased significantly in the public condition, primarily driven by an increase in people's propensity to sell stocks that had increased in value relative to the purchase price.

Although we do not provide direct evidence for the underlying process, we speculate that the spike in the realization of gains observed in the public condition may at least in part result from people's attempt to avoid the embarrassment of finishing the trading session at the bottom of the performance ranking. That is, investors derive explicit disutility from ending in the bottom group when having to disclose his or her financial performance to peers, which contrasts to the notion of a rational investor who only derives utility over final wealth. Our evidence suggests that the spike in the realization of gains is the channel through which this process occurs. Put simply, selling gains may be seen as a good/safe strategy for someone who wants to avoid the bottom investors' performance rank.

The rest of the paper is organized as follows. In Section 2, we discuss the related research. In Section 3, we detail the lab experiment whereas in Section 4 we build a theoretical argument to understand and explain the results from our experiment. Section 5 provides a general discussion along with robustness checks and section 6 concludes.

## **2. Related Research**

The DE represents one of the classic anomalies in behavioral finance (Shefrin and Statman 1985; Barberis and Thaler 2003). People are more prone to sell assets that have increased in value relative to the purchase price than those that have decreased in relation to the same reference point. Although it is difficult to explain from a rational standpoint, this phenomenon has been observed in conventional stocks markets (Ferris, Haugen, and Makhija 1988, Frazzini 2006, Lakonishok and Seymour 1986, Odean 1998), e-trading (Lee, Park, Lee,

and Wyer 2008), and behavioral and neuroeconomic laboratories (Frydman et al. 2011, Weber and Camerer 1998).

Analyses at the individual level show that investor expertise tends to reduce the DE (Calvet, Campbell, and Sodini, 2009; Dhar and Zhu 2006, Feng and Seasholes 2005). Nonetheless, the DE has, in general, been shown to be prevalent across markets and cultures. The phenomenon has been observed in Australia (Brown et al. 2006), Finland (Grinblatt and Keloharju 2001), Japan (Bremer and Kato 1996), and Taiwan (Barber et al. 2008), among other countries. We rely on this well-documented effect to address a yet unexplored research avenue in financial decision-making: the extent to which investors' decisions, and consequently, the DE, vary when they are aware that their financial performances will be made public (vs. kept private).

Whether consciously or not, an individual will naturally attempt to influence how others perceive him. These self-presentation or impression management concerns and tactics have been shown to impact people's feelings, thoughts, judgments, and decision-making (Goffman 1959, Jones and Pittman 1982, Schlenker 1980). Consumers, for instance, feel more embarrassed when buying condoms next to strangers than alone (Dahl, Manchanda, and Argo 2001), and choose to purchase a greater variety of goods in public than in private because they expect the variety to be more valued by others (Ratner and Kahn 2002).

There is also evidence suggesting that at least some institutional investors use impression management strategies when it comes time to disclose their financial performance to their clients. For instance, Lakonishok et al. (1991) showed that pension funds—particularly smaller ones, at the end of the fourth quarter—are disproportionately more likely to have their poorly-performing holdings sold, to dispose of what the client would likely see as a 'bad bet' (see also: Musto, 1999). Similarly, Hertzberg, Liberti, and Paravisini (2010) showed that loan officers are more likely to self-report bad news at times when it is expected to have a lower

impact on their career prospects (see also Hertzberg, Liberti, and Paravisini 2011). In those cases, however, the “window dressing” strategies are often explained by sheer financial reasons (e.g., to avoid losing a client, or avoid losing a job), rather than psychological ones, such as the potential embarrassment or pride one may feel as a result of public exposure of performance. . Moreover, none of these strategies focuses on their respective overall impacts on the DE.

We argue that self-presentation to peers should impact the individual investors’ decision-making in a stock market simulation setting. There are a few reasons to believe so.

First, the expected publicity of performance outcomes tends to impact one’s decisions. For instance, McManus and Rao (2015) show that, when observed by others, participants in a lab experiment distort their behavior and avoid displaying intellectual ability and ambition traits. Instead of projecting themselves as “high types”, they opt for choices associated with “low-type” ability when observed by a social audience, despite evidence that the underlying trait was privately considered to be desirable. Ashraft et al (2014) find evidence that, in a health work training program in Zambia, employer recognition and social visibility increase performance while social comparison reduces it, especially for low-ability trainees. The socialization of results is also found to have an impact on employee motivation (Marino and Ozbas, 2014).

Further, investors tend to believe that skills, rather than sheer luck, determine financial performance in the stock market (Barber and Odean 1999). Therefore, it is reasonable to expect that the pride felt over a successful investment decision or the embarrassment of a failed one in front of peers will have an anticipatory impact on people’s decisions in stock-market settings. There is evidence in the literature to support this intuition (Bault et al. 2008). For instance, the DE is increased when traders have access to a social network due to negative peer reinforcement and amplification of loss aversion (Heimer, 2014). Our findings are consistent with those reported in Heimer (2014). Our paper, however, differs in important aspects with respect to Heimer’s. In his case the investor endogenously chooses whether to tell others about

his performance, whereas in our case we sidestep the endogeneity issue as the participants in the lab experiment are exogenously forced to disclose his or her performance in the public condition.

We lean on this literature to conduct a lab experiment in order to study the impact of publicity of an individual investor's financial performance on DE. The next section details the experiment.

### **3. Lab Experiment**

This experiment tests the extent to which anticipated disclosure of financial performance to peers impacts the DE in a stock market simulation. Given that relative to a private setting, anticipated disclosure to peers further highlights the social costs and benefits of future pride or embarrassment, respectively, we expect the DE to vary between the private vs. public settings. This is in line with existing results in the literature on the effects of publicity of results (Bault et al. 2008).

#### **3.1 Experiment Methodology**

*Sample and Design.* Sixty-three students participated in a one-hour experiment. The experiment employed a two (financial performance: public vs. private; between) by two (realization: gains vs. losses; within) by two (predetermined market trend: A vs. B) mixed design. The predetermined market trend factor served as a replicate.

*Procedure.* Each experimental session took place in a behavioral laboratory. Before the simulation started, all participants were informed that they would be playing a stock market simulation and that their individual performances would determine their final payment. They

were given specific instructions about the simulation and were told that they would be paid in cash at the end of the session. Participants were either told that their performance in the simulation would be made public or told that their performance would be kept private. Participants then played the simulation and revealed, or did not, their performances to others, and were paid according to their final earnings.

*Stock Market Simulation.* A 30-period stock market simulation was developed for the experiment. At the start of the simulation, each participant was given 10,000 monetary units, which they were told was the equivalent of 10 Brazilian Reais (approximately \$5 USD at the exchange rate prevailing at the time). They used this sum for their stock buying and selling trades during the simulation. After the simulation was complete, each participant exchanged their final balance (cash balance plus the value of the portfolio) in monetary units for the equivalent amount in Reais.

In each trading period, which lasted up to three minutes, they were allowed to buy and sell one, or several, of the six stocks available in the market (Note: a similar procedure was applied in Weber and Camerer, 1998)

In the first four rounds, the participants simply observed the stock trends to obtain some initial information about the market. From the fifth round on, they were allowed to trade. To assess the scope of the effects, two different market trends were generated and randomly assigned to the participants in each condition. They were paid based on their ending total assets (cash balance plus the value of the portfolio, at the end of the 30<sup>th</sup> period), which indicates their respective financial performance.

Participants were given information on the price variations of the six stocks, modeled on the six stocks with the highest number of trades (during an unspecified period) on the São Paulo Stock Exchange. Participants were randomly assigned to either one of the two market trends considered in the experiment: positive or negative trend. Each market trend dataset contained

different securities, but the criterion of choice for collecting the price series was always the highest number of trades. The main feature of the positive market trend is that the equally-weighted portfolio invested in the six assets belonging to that trend has a positive average return. Similarly, in the negative market trend the equally-weighted portfolio invested in the six assets belonging to that trend has a negative average return. We depict in Figures 1 and 2 the price series of each of the six stocks (A to F) of the positive and negative market trends, respectively. No information is given as to which of the two market trends the participant is trading on.

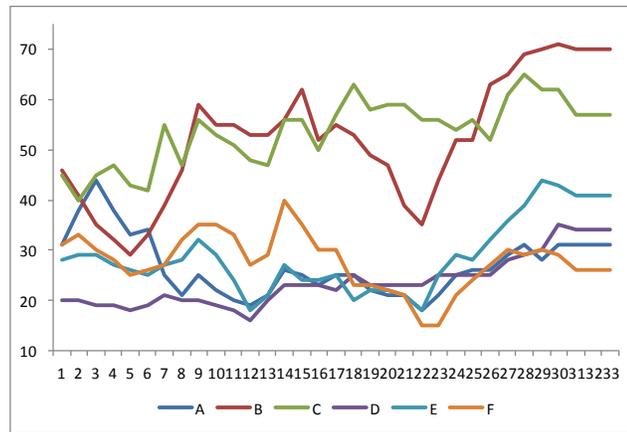


Figure 1: Price series of the six stocks (A to F) in the *positive* market trend

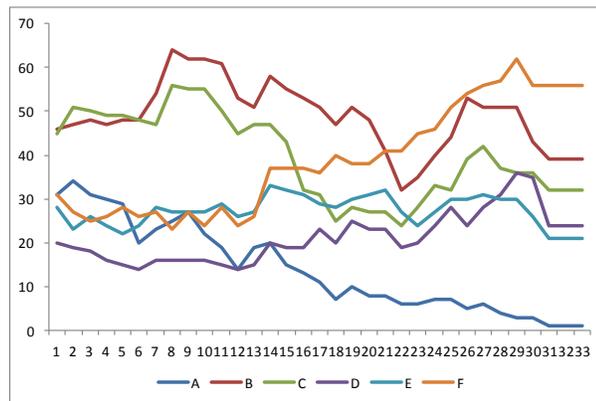


Figure 2: Price series of the six stocks (A to F) in the *negative* market trend

The simulation design employed in this study has certain peculiarities, which are described below:

a) the design includes a larger number of trading periods than were used by Weber and Camerer (1998), whilst allowing a shorter period of time for participants to trade. In Weber and Camerer's experiments the average time taken by each student was 2 hours. In contrast, the maximum duration of the experiments described in this paper was 60 minutes.

b) the low number of shares used by Weber and Camerer (1998) was maintained (at six shares). The prices of these shares were generated on the basis of historical data on shares that were part of the Ibovespa index during a past period, when the market was following either a rising or falling trend.

c) no additional information is provided beyond the current prices of each stock and their previous prices.

f) the computerized simulation offers the option to save a final output file containing a report listing all the buy and sell trades made by each participant during the simulation. This report enables calculation of returns and of risks incurred, in addition to analyses of the effects under investigation in this study.

g) the simulation conducted by Weber and Camerer (1998) lasted 14 periods and offered 6 shares to trade, but it is assumed that these numbers were limited by the fact that the simulation was not implemented with the aid of a computer. Since our simulations are computerized, we chose to simulate up to 30 periods. See below a screenshot of the stock market simulation's interface.



Figure 1: Main Screen (ExpEcon)

*Public vs. Private Manipulation.* All of the participants were informed both verbally and on the instruction sheet that they should write down their total assets (cash balance plus the value of the portfolio, at the end of the 30<sup>th</sup> period) on a sheet of paper located next to the computer, and that they would be paid accordingly. The participants in the “public” condition were told that at the end of the experimental session, they should come to the white board and write down their full name and total assets. The participants in the “private” condition were asked to put the sheet of paper with the reported earnings into an envelope. The experimenter would then pick up the envelope from each participant, privately insert the corresponding payments, and then hand them back to the participants. It was conveyed to them that their performance would be kept completely private.

*Dependent Variable(s)*. The presence and size of the DE was computed following Odean's (1998) procedure. First, for each period, the stocks were classified into four categories: "realized gains" ("losses") for the stocks that were sold after having increased (decreased) in value relative to the purchase price, and "paper gains" ("losses") for the stocks that were not sold after having increased (decreased) in value relative to the same. The totals of winning and losing stocks sold and held in each period was tallied, and the proportion of gains and losses realized was computed:

$$PGR_i = \frac{N_{rg}^i}{N_{rg}^i + N_{pg}^i}, \quad PLR_i = \frac{N_{rl}^i}{N_{rl}^i + N_{pl}^i}$$

where  $N_{rg}^i$  ( $N_{rl}^i$ ) is the number of trades by investor  $i$  with a realized gain (loss) and  $N_{pg}^i$  ( $N_{pl}^i$ ) is the amount of the paper gain (loss) for investor  $i$ .

The disposition effect coefficient ( $DC$ ) of investor  $i$  is then

$$DC_i = PGR_i - PLR_i,$$

where  $-1 \leq DC_i \leq 1$ . A positive  $DC_i$  value indicates that a larger proportion of gains was realized, compared with the proportion of losses realized, in which case investor  $i$  displays the DE.

Note that the above analyses can be conducted at either the individual or aggregate level (Odean 1998, Shefrin and Statman 1985, Weber and Camerer 1998). At the individual level, the proportion of gains and losses realized *by each participant* is computed and then averaged across participants. At the market level, the proportion of realized gains and losses is based on the total sum of realized gains and losses, along with paper gains and losses, of all participants in a given market or setting. Both analyses were conducted and reported. Note that,

whereas the individual level of analysis generates four proportional averages, with the unit of analysis being the participant (hence, a relatively small sample size), aggregate analysis generates four actual proportions, with the unit of analysis being the transactions (hence, a much larger sample size). T tests were used in individual analysis, whereas z tests for comparing proportions were used in the market level analysis.

### 3.2 Results

Tables 1 and 2 show the results from the Individual and Aggregate level of analysis.

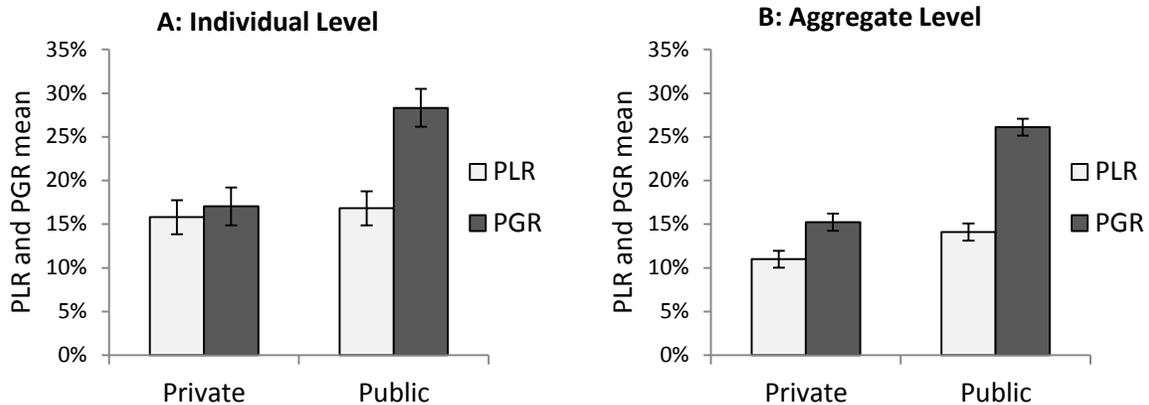
Table 1 – Descriptive statistics for <u>individual</u> DCs			
	Total	Public	Private
Sample size	63	33	30
PGR <sub>i</sub> mean	0.2295	0.2832	0.1704
PLR <sub>i</sub> mean	0.1634	0.1683	0.1580
DC <sub>i</sub> mean	0.0661	0.1149	0.0124
DC <sub>i</sub> median	0.0752	0.1017	0.0213
DC <sub>i</sub> max	0.6028	0.6028	0.3015
DC <sub>i</sub> min	-0.6022	-0.6022	-0.4643
DC <sub>i</sub> std. dev.	0.2100	0.2363	0.1643
<i>t</i> test for mean DC <sub>i</sub> = 0 ( <i>p</i> -value – two tailed)	2.4976*** (0.0063)	2.7944*** (0.0026)	0.4118 (0.3402)
<p>Individual level (two samples, unequal variance)</p> <p>(1) The test to verify PGR(private) ≠ PGR(public) is <math>t = 3.16</math>, <math>p</math>-value = 0.002</p> <p>(2) PPR(private) ≠ PPR(public), <math>t = 0.23</math>, <math>p</math>-value = 0.816</p> <p>(3) DC(public) &gt; DC(private), <math>t = 2.02</math>, <math>p</math>-value (one-tailed) = 0.024</p> <p>(4) * significant at 10%; ** significant at 5%; *** significant at 1%</p>			
Table 2 – Descriptive statistics for <u>aggregate</u> DCs			
	Total	Public	Private
Sample size	63	33	30
Realized gains (RG)	600	383	217
Realized losses (RL)	360	214	146
Paper gains (PG)	2291	1084	1207
Paper losses (PL)	2486	1303	1183
$PGR = RG / (RG + PG)$	0.2075	0.2611	0.1524

$PLR=RL/(RL+PL)$	0.1265	0.1411	0.1099
$DC =PGR - PLR$	0.0810	0.1200	0.0425
Std. Error ( $PGR-PLR$ )	0.0098	0.0145	0.0128
Z stat. ( <i>p-value</i> )	8.2842 <sup>***</sup> (0.0000)	3.3182 <sup>***</sup> (0.0005)	8.2544 <sup>***</sup> (0.0000)
<p><u>Aggregate level</u>            (1) one-tailed tests: Null hypothesis: <math>DC \leq 0</math>; Alternative hypothesis: <math>DC &gt; 0</math>;            (2) Comparing the proportion of <u>gains realized</u> (PGR) between Public and Private:            Public: 383/1467(=0.2611) vs.Private: 217/1424 (=0.1524), <math>Z=7.20</math> ***            (3) Comparing the proportion of <u>losses realized</u>(PLR) between Public and Private:            Public: 214/1517 (=0.1411) vs.Private: 146/1329 (=0.1099), <math>Z= 2.50</math> **            (4) Test to verify if <math>DC(\text{public}) \geq DC(\text{private})</math>                a) Using SE of total sample: <math>Z =(0.1200-0.0425)/0.0098=7.91</math>***                b) Using SE of two subsample: <math>Z = (0.1200-0.0425)/(0.0145^2+0.0128^2)^{1/2}=3.997</math>***            (5) * significant at 10%; ** significant at 5%; *** significant at 1%</p>			

Individual level of analysis. The market trend (A vs. B) did not impact the type of realization (gain vs. loss) and/or the anticipated disclosure of the participant's performance (private vs. public). The two market trends conditions were then collapsed. In general, the participants demonstrated a significant DE. They were more prone to sell the stocks that had increased in value relative to the purchase price than they were those that had decreased in value relative to the same. However, this primary effect on the participants' selling decisions was qualified by a significant interaction between the type of realization (gains vs. losses) and the anticipated disclosure of performance (public vs. private). When it was made explicitly clear to the participants that their financial performance would be kept private, the participants were only slightly more prone to realize gains than they were to realize losses.

However, when the participants knew that they would be required to approach the whiteboard and write their name and financial performance—the “public” condition—they realized gains much more frequently than losses. A comparison within the type of realization shows that the impact of the public or private designation on the increased DE was driven by the changes in the realization of gains. There was no significant difference between the PLRs when the private and public groups were compared. However, the participants were more prone to realize their gains when they knew that their performance would be made public as opposed

to kept private. Figures A and B show the differences between PLR and PGR for the individual and aggregate level of analysis.



*Aggregate level of analysis.* In general, the pattern of results at the aggregate level of analysis mirror those obtained with the individual level, although some small differences were also observed. Firstly, the DE was perceptible, in that the winning stocks were sold much more frequently than losing ones. Contrary to the individual level, the winning stocks were sold more frequently than the losing stocks within both the public and private groups.

However, confirming the interaction observed at the individual level, the DE in the public condition was positive and significantly larger than that of the private condition. A comparison between the types of realization showed that the participants were more prone to realize gains under the public than the private setting. Despite this, the same trend was also observed for losses, albeit to a lesser extent.

### 3.3 Discussion of Results

The results of the experiment show that the participants made different financial decisions in the stock market simulation when they expected their performance to be made public compared to the situation in which they expected their performance to be kept private.

Whether from individual or aggregate-level analysis, two conclusions can be drawn. First, there is an increase in the DE under the public setting compared with the private. Furthermore, the effect is primarily driven by an increase in people's propensity to sell stocks that have increased in value relative to the purchase price. Why might this be the case?

#### **4. Hedging Against Embarrassment**

We speculate that the spike in the realization of gains observed in the public condition of the experiment represents people's attempt to avoid the embarrassment of finishing the trading session at the bottom of the performance ranking (i.e., among the low performers on the white board). We argue that everything else being equal, our participants are more likely to hold to the goal of avoiding embarrassment than that of achieving pride.

Empirical evidence from related areas provide support for the assumption that bad is stronger than good (Baumeister et al. 2001, Rozin and Royzman 2001). Negative emotions are more frequent than positive ones (Averill 1980); negative events wear off more slowly than positive ones (Brickman, Coates, and Janoff-Bulman 1978); financial losses hurt in a degree greater than that in which gains of the same magnitude bring pleasure (Kahneman and Tversky 1984). Therefore, it is possible that, for most people, the embarrassment of a failed performance will loom larger than the pride of a successful one. Recent evidence supports the notion that people are relatively sensitive about the 'bottom' of the ranking and try hard to avoid it, which has been labeled 'last-place aversion' (Kuziemko et al. 2011).

Further, we suspect that participants are likely to hold the belief that selling gains represents a reasonable strategy for the avoidance of a poor performance. Because the purchase price is a strong reference point from which to judge the relative performance of the portfolio, the realization of gains allows people to, if only subjectively, form a financial cushion to

compensate for current and/or future losses. In addition, selling gains can give the impression that one is moving up the ladder, or, at least, avoiding its bottom. Thus, in the case of a “public” setting, being extra risk-averse in terms of gains may be the result of an attempt to avoid the embarrassment of ending the trading session among the lowest-ranked investors on the financial performance ranking.

## **5. General Discussion**

When people anticipate revealing their financial performance (i.e., earnings), they display a stronger DC (disposition coefficient), driven primarily by a higher tendency to sell the stocks that have increased in value relative to the purchase price. This phenomenon may result from people’s strategic attempt to hedge against the embarrassment of ending the trading session among the poor performers.

### **5.1 DE on Returns**

If participants attempted to realize gains more frequently than losses to hedge against embarrassment, testing for whether or not the strategy was generally successful is merited. In other words, did those who display stronger DEs show, on average, a better financial performance in the simulation? A regression analysis with the participants in the “public” setting indicates that larger DCs do not improve financial performance. If anything, the correlation coefficient points to the contrary ( $\beta = -0.1729 (0.3623)$ ,  $t (28) = -0.47$ ,  $p = .637$ ). These results resonate with previous findings in the literature, which demonstrate that the DE does not enhance financial performance and often has a damaging effect on returns (Odean 1998; Weber and Camerer 1998).

### **5.2 Turnover, Cushion and other strategies**

A series of multiple regressions (Table 7) assessed the association between the DC and additional variables.

Table 7 – Regression analysis for control variables

DC	Interc.	1=Publ. 0=Priv.	Volat.	Cushion	Turnover	Stocks Mean Quantity	Trans.
Model 1 <b>0.0688</b>	-0.0104 (0.0426)	0.1289* (0.0581)					
Model 2 <b>0.0755</b>	0.0741 (0.0836)	0.1450** (0.0595)	-0.0221 (0.0188)				
Model 3 <b>0.0580</b>	0.0576 (0.1099)	0.1449** (0.0601)	-0.0214 (0.0193)	0.0262 (0.1121)			
Model 4 <b>0.0688</b>	0.1428 (0.1286)	0.1580** (0.0606)	-0.0202 (0.0192)	-0.0642 (0.1328)	-0.5916 (0.4709)		
Model 5 <b>0.0495</b>	0.1604 (0.2616)	0.1589** (0.0623)	-0.0209 (0.0214)	-0.0712 (0.1613)	-0.6246 (0.6391)	-0.0028 (0.0374)	
Model 6 <b>0.0372</b>	0.1455 (0.2644)	0.1695** (0.0649)	-0.0215 (0.0216)	-0.0726 (0.1624)	-0.5155 (0.6669)	0.0064 (0.0405)	-0.0005 (0.0009)

(1)The table presents the coefficient, and in parentheses the robust standard error. In bold, the adjusted R<sup>2</sup>.

$$(2)DC_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + u_i$$

Where  $X_{1i}$  = 1 is the binary variable for participants in “public” setting and  $X_{1i}$  = 0 for the private setting;  $X_{2i}$  is the average standard deviation of the assets comprising the portfolio of each participant in the simulation period. This average is weighted by the percentage share of each asset in the portfolio of the participant, and the standard deviation of each asset is calculated based on price fluctuations, i.e., as rounds are played, the data set used to calculate the standard deviation of the asset increases (Volatility);  $X_{3i}$  is the average percentage of his total assets that the participant keeps in cash each period as a proportion of total equity (Cushion);  $X_{4i}$  is the average percentage of investment assets traded in relation to total assets (investments plus cash) per period (Turnover). For example: a participant who has a total of 10,000 monetary units (investments plus cash balance) who trades 5,000 monetary units has a turnover of 50%;  $X_{5i}$  is the average number of stocks held in portfolio, varying between 0 and 6, which is the total number of options in the simulation (Stocks Mean Quantity);  $X_{6i}$  is the total number of buy and sell per participant (Trans.).

(3)The total sample includes 63 participants. When the volatility variable is included, the number of participants drops to 54.Nine participants are excluded due to data capture error in the simulation software. A similar procedure was adopted in Dhar and Zhu (2006).

(4)White’s (1980) regression correction was employed: heteroskedasticity-consistent standard errors.

(5)\* significant at 10%; \*\* Significant at 5%; \*\*\*Significant at 1%

Apart from public and private setting, no other explanatory variable showed significant results. Some findings suggest that Turnover (defined as the average percentage of investment

assets traded in relation to total assets - investments plus cash balance - per period) is associated with overconfidence or the DE, and that, in general, it causes poorer financial performance (Barber and Odean, 2000; Statman et al, 2006).

We assume that a possible strategy to avoid the embarrassment of being among worst performers would be that of making fewer transactions; in theory, the risk of losing transactions would be lower thusly. However, a simple regression with all participants in the “public” setting indicates that the turnover variable has no explanatory power for the DE ( $\beta = -0.2955$  (0.6124),  $t(28) = -0.48$  |  $p = 0.63$ ). Furthermore, the effect is found to be the opposite of that originally expected, that is, the greater the DE in the “public” setting, the lower the turnover.

As to the private setting, the direction of the correlation is similar; however, there is an explanatory power in the Turnover variable:  $\beta = -0.8111$  (0.4398),  $t(24) = -1.84$  |  $p=0.078$ . The significance of the Turnover variable corroborates the results found by Barber and Odean (2001) and Statman et al. (2006).

A consideration of the fact that relatively few sales of losing positions took place may explain part of this contradictory movement between turnover and DE. The tendency toward holding losing positions for longer confirms the decrease in turnover, simultaneously increasing the DE.

According to Table 7, the “financial cushion” strategy of holding onto cash provided by realized gains was not significant. Consequently, it is observed that the control variables, in general, showed no great explanatory power for variations the DE.

### **5.3 Conclusion**

Financial performances are often expected to be made public. In this paper, we show that whether the performance is expected to become public or kept private has a systematic impact on financial decision making. In a lab experiment, we show a significant increase in the

disposition effect when financial performance is to be made public. This increase results essentially from a spike in the realization of gains. We speculate that people are selling gains in a strategic attempt to hedge against the embarrassment of ending the trading session at the bottom of the performance rank. Future research should assess the robustness of the phenomenon and the role of the proposed psychological mechanism. We hope that these findings will provide further insights into the role of social incentives in individual financial decision-making.

## 6. References

- Ashraf, N.; Bandiera, O.; Lee, S. 2014. Awards unbundled: Evidence from a natural field experiment. *Journal of Economic Behavior & Organization*, 100, 44–63.
- Averill, J.R. 1980. On the paucity of positive emotions. In *Assessment and Modification of Emotion Behavior*, 6, Kirk R. Blankstein, P.P.& J.Polivy, (eds.) New York, Plenum: 7 45.
- Barber, B. M., Lee, Y-T, Liu,Y-J &Odean, T 2008.Just How Much Do Individual Investors Lose by Trading.*Review of Financial Studies*, 22 (2), 609-632.
- Barber, B.M., Odean T. 2001. The Internet and the Investor.*Journal of Economic Perspectives*, 15 (1), 41-54.
- Barber, B.M., Odean T.1999. The Courage of Misguided Convictions: The Trading Behavior of Individual Investors.*Financial Analyst Journal*, November/December, 41-55.
- Barberis, N., Thaler, R. 2003. A Survey of Behavioral Finance.In the *Handbook of the Economics of Finance*, Vol. 1, Part b, Ch. 18, G.M. Constantinides, M. Harris, and R. Stulz (eds.), Elsevier: 1053-1121.
- Bault, N.; Coricelli,G.; Rustichini, A.; 2008. Interdependent Utilities: How Social Ranking Affects Choice Behavior. *PLoS ONE* 3(10): e3477.
- Baumeister, R., Bratslavsky, E., Finkenauer, C., Vohs, K.D. 2001. Bad Is Stronger than Good. *Review of General Psychology*, 5(4), 323-370.
- Bremer, M. and Kato, K. 1996. Trading Volume for Winners and Losers on the Tokyo Stock Exchange. *Journal of Financial and Quantitative Analysis*, 31, 127-142.

- Brickman, P., Coates, D. and Janoff-Bulman, R.1978. Lottery Winners and Accident Victims: Is Happiness Relative? *Journal of Personality and Social Psychology*, 36(8), 917-927.
- Brown, P., Walter, T., Chappel, N., da Silva Rosa, R. 2006.The Reach of the Disposition Effect: Large Sample Evidence Across Investor Classes. *International Review of Finance*, 6(1-2), 43-78.
- Calvet, L. E., Campbell, J.Y.,Sodini, P. 2009. Fight or Flight? Portfolio Rebalancing by Individual Investors? *Quarterly Journal of Economics*, 124(1), 301-348.
- Dahl, D. W., Manchanda, R.V., Argo, J.J.2001. Embarrassment in Consumer Purchase: The Roles of Social Presence and Purchase Familiarity. *Journal of Consumer Research*, 28 (3), 473–81.
- Derman, E. 2004. My Life as a Quant: Reflections on Physics and Finance. Wiley
- Dhar, R. and Zhu, N. (2006). Up Close and Personal: Investor Sophistication and the Disposition Effect. *Management Science*, 52(5), 726-740.
- Endlich, L. 2000. Goldman Sachs : The Culture of Success. Touchstone
- Feng, L.,Seasholes, M.S. 2005. Do Investor Sophistication and Trading Experience Eliminate Behavioral Biases in Financial Markets? *Review of Finance*, 9(3), 305-351.
- Ferris, S.P., Haugen, R.A. and Makhija, A.K. 1988. Predicting Contemporary Volume with Historic Volume at Differential Price Levels: Evidence Supporting the Disposition Effect. *Journal of Finance*, 43 (July), 677–97.
- Frazzini, A. 2006. The Disposition Effect and Under-Reaction to News. *Journal of Finance*, 61 (4), 2017–2046.
- Frydman, C., Barberis, N., Camerer, C., Bossaerts, P., Rangel, A. 2011. Testing Theories of Investor Behavior Using Neural Data. *Working paper*, California Technology Institute.
- Goffman, E.1959. *The Presentation of the Self in Everyday Life*. Garden City, NY: Penguin.
- Grinblatt, M. and Keloharju, M.2001. How Distance, Language, and Culture Influence Stockholdings and Trades. *Journal of Finance*, 56(3), 1053-1073.
- Heimer, R. Z. 2014 Peer Pressure: Does Social Interaction Explain the Disposition Effect?", AFA Boston 2015, NFA Ottawa 2014.
- Hertzberg, A., Liberti, J.M. and Paravisini, 2011 Public Information and Coordination: Evidence from a Credit Registry Expansion. *Journal of Finance*, 66 (2), 379-412.
- Hertzberg, A., Liberti, J.M. and Paravisini, D.2010. Information and Incentive Inside the Firm: Evidence from Loan Officer Rotation. *Journal of Finance*, 65, 3, 795-828.

- Jones, E.E. and Pittman, T.S.1982. Toward a general theory of strategic self-presentation. In *Psychological Perspectives on the Self*, vol. 1, J. Suls, ed. Hillsdale, N.J.: Erlbaum, 231-262.
- Kahneman, D.; Tversky, A. 1979. Prospect Theory: an analysis of decision under risk. *Econometrica*, v.47, n.2, March, p.263-292.
- Kahneman, D.; Tversky, A. 1984. Choices, Values and Frames. *American Psychologist*, 39(4), 341-350.
- Kuziemko, I., Buell, R.W.,Reich, T. and Norton, M.I.2011. ‘Last-place Aversion’: Evidence and Redistributive Implications. *Working Paper* No 17234, National Bureau of Economic Research.
- Lakonishok, J. and Smidt, S.1986. Volume for Winners and Losers: Taxation and Other Motives for Stock Trading. *Journal of Finance*, 41 (4), 951–74.
- Lakonishok, J., Shleifer, A., Thaler, R. and Vishny, R. 1991. Window Dressing By Pension Fund Managers. *American Economic Association Papers and Proceedings*, 81(2), 227-231.
- Lee, H-J, Park, J.,Lee,J-Y, and Wyer, R.2008. Disposition Effects and Underlying Mechanisms in E-Trading of Stocks. *Journal of Marketing Research*, XLV (June), 362-378.
- Linde, J.; Sonnemans, J.; 2012. Social comparison and risky choices, *J Risk Uncertain* 44:45–72
- Marino, A.; Ozbas, O. 2014. Disclosure of status in an agency setting. *Journal of Economic Behavior & Organization* 105 (2014) 191–207.
- McManus, T.C.; Rao, J.M. 2015 Signaling Smarts? Revealed Preferences for Self and Social Perceptions of Intelligence, *Journal of Economic Behavior and Organization*. Volume 110, Pages 106–118.
- Musto, D.K. 1999. Investment Decisions Depend on Portfolio Disclosures. *Journal of Finance*, 54, 935.952.
- Odean, T. 1998. Are Investors Reluctant to Realize Their Losses? *Journal of Finance*, LIII, 5 (October), 1775-1798.
- Ratner, R.K., & Kahn, B.K. 2002. The Impact of Private versus Public Consumption on Variety-Seeking Behavior. *Journal of Consumer Research*, 29, 246-257.
- Rozin, P. and Royzman, E.B. 2001. Negativity Bias, Negativity Dominance, and Contagion. *Personality and Social Psychology Review*, 5 (4), 296-320.
- Schlenker, B.R. 1980.*Impression Management: The Self-Concept, Social Identity, and Interpersonal Relations*. Monterey, CA: Brooks/Cole

- Shefrin, H., and Statman, M.1985. The disposition to sell winners too early and ride losers too long: Theory and evidence.*Journal of Finance*, XL, 3 (July), 777-790.
- Statman, M.; Thorley, S.; Vorkink, K. 2006. Investor overconfidence and trading volume. *Review of Financial Studies*, 19(4), 1531-1565.
- Tangney, J.P. and Fischer, K.W.1995.*Self-Conscious Emotions: The Psychology of Shame, Guilt, Embarrassment, and Pride*. Guilford Press, NY.
- Weber, M. and Camerer, C.F.1998. "The Disposition Effect in Securities Trading: An Experimental Analysis," *Journal of Economic Behavior & Organization*, 33 (2), 167–84.