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Disposition Effect in Currency Trading: an Evidence from Experimental Student Games

Hana DVORACKOVA[1], Marek JOCHEC[2], Tomas TICHY[3]

Abstract

The disposition effect has been described in the stock-investing context as a behavioral tendency of investors to hold on to losing stocks for too long and sell winning stocks too soon. In this paper it is examined whether the disposition effect can be confirmed also in the experimental student game of currency trading data set. The presence of the disposition effect leads to the conclusion that students, despite using demo money, were trading with real behavioral bias and various interesting findings concerning gender differences and size of the trade are discussed. The experimental data set was collected by Jochec during years 2009 to 2015, students were trading under standardized rules. In this paper the holding periods of profitable and unprofitable trades were tested and compared. Based on these calculations the general presence of the disposition effect in the data set was confirmed. Moreover it was confirmed that males and females have different tendency to succumb to this bias.

Keywords: financial behavior, currency trading, experimental finance, risk attitude, student game.

Introduction

The standard assumption of investment theory is that the markets are perfect and all agents act rationally. In reality, however, market frictions exist; it is neither easy nor costless to acquire information necessary to make eligible investment decisions and people often follow sentiments instead of sharp numbers.

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One of such consequences described in the stock-investing context is known as the disposition effect. As an implication of the Kahneman & Tversky´s (1979) prospect theory to investment, it is a behavioral tendency of investors to hold on losing stocks for too long (i.e., losing more and more) and sell winning stocks too soon (i.e., earning less than would be optimal). Accordingly, a person who has not made peace with his or her losses tend to accept gambles, which would not be otherwise acceptable. As argued by Odean (1998), the most obvious explanations – explanations based on informed trading, rebalancing, or transaction costs – fail to capture important features of the data. Analyzing records for 10,000 accounts at a large discount brokerage house proved the tendency of investors to hold losing investments too long and sell winning investments too soon. Notwithstanding, a first paper labeling this behavioral effect as the disposition effect was published by Shefrin & Statman (1985), Pelster & Hofmann (2018).

Over time, various studies focused on the trader's behavior and the disposition effects have been published. For example, Barberis and Xiong (2009) investigated whether prospect theory preferences can predict a disposition effect; Kaustia (2010) included a chapter focused on the disposition effect into the book Behavioral Finance: Investors, Corporations, and Markets. Moreover, Choe and Eom (2009) examined whether the disposition effect exists in the Korean stock index futures market. These authors also found strong evidence for the disposition effect and explained it in terms of investor characteristics. Besides that, Chen *et al.* (2007) studied the investment decision making in emerging markets. According to them Chinese investors, besides other, tend to sell stocks that have appreciated in price, but not those that have depreciated in price, which is consistent with the disposition effect, acknowledging gains but not losses. Similarly, also the results by Marciukaityte & Szewczyk (2012) are in accordance with the proposition that the disposition effect increases the supply of winning stocks and depresses their prices. On the contrary, Locke and Mann (2005) found no evidence of any contemporaneous measurable costs associated with the disposition effect.

The aim of our research is to show whether the disposition effect is present in the experimental student data sample, while it is supposed, that its presence supports the presumption that the students have the same, or at least similar biases, as real traders. Moreover, it is examined, whether any differences in the tendency to the disposition effect bias within gender and finally the relationship between the size of the trade and the disposition bias can be identified. In particularly, we proceed as follows. The upcoming Section 2 reviews theoretical background, while in Section 3 the data set and the methodology are provided. Finally, in Section 4 the results are discussed.

Disposition effect and trading

There are two main approaches to financial decision-making and asset pricing. First of all the traditional neoclassical finance, whose proponents treat sentiment as minor determinant of market prices and assume that investors are mostly free of biases in their decision-making, focusing on the fundamental risk or time varying risk aversion and seeking to maximize the expected utility, which is a rationality-based framework. Contrary the behavioural approach accepts sentiment as the major determinant of market price and proponents are very critical to the expected utility as the main descriptive theory. They suggest that people usually do not behave exactly in accordance with expected utility theory, because their behaviour contains several psychological biases. One of the most important theories, taking into account the behavioural biases is the *Prospect theory* by Kaheman and Tversky (1979), which combined several insights due to Markowitz (1952) and Allais (1953). Within the Prospect theory, the disposition effect has been mentioned for the first time.

The Prospect Theory

Prospect theory, designed by Kaheman and Tversky (1979) is the main theoretical descriptive framework describing actual choice patterns, while one of the main aims is to describe why people tend to make inferior choices. There are four main attributes, differentiating the prospect theory from the expected utility approach: (1) prospect theory suppose that the carriers of value are gains and losses relative to a reference point, contrary to the expected utility theory, which is based on the assumption that the carriers of value are final wealth; (2) prospect theory postulates that tolerance for risk is different, when it is concerning gains, than concerning losses, on the other hand, the expected utility theory see the people´s tolerance for risk as reasonably uniform; (3) prospect theory assumes that people do not weight probabilities correctly, they tend to overweight some probabilities and underweight others, while the expected utility theory assumes the correct perception of probabilities; (4) prospect theory assumes that the manner in which decision tasks are described or framed might influence the decision-making procedure; contrary the expected utility theory see people as immune to these manners.

The work of Kaheman and Tversky (1979) is based on a series of experiments, performed to identify the way in which people make decision (choices) under risk. These experiments were structured as binary choices, some of them are stated below.

First question leads to the explanation of the *Common Ratio Effect*, following Shefrin (2008: 393-394) we can assume the following example.

1. Imagine that you have an opportunity to play one of two gambles described below. The gambles are denoted 1A and 1B. If you had to make a choice between the two, which would you choose, 1A or 1B?

1A: 90% chance of winning $2000, 10% chance of $0.

1B: 45% chance of winning $4000, 55% chance of $0.

2. Imagine that you have and opportunity to play one of two gambles described below. The gambles are denoted as 2A and 2B. If you had to make a choice between the two, which would you choose, 2A or 2B?

2A: $2000 with probability .002, $0 with probability .998

2B: $4000 with probability .001, $0 with probability .999

Shefrin (2008) argues that, typically, most of the people choose 1A to 1B and almost everyone chooses 2B over 2A. The point is, however, that such decision is not in accordance with the expected utility theory. Let us suppose that a person has a utility function *u(x)*, where *x* represents the outcome of the game. Without loss of generality, $u(0)$ can be set at 0 and $u(4000)$ can be set at 1. Write $u(2000)$ for the utility attached to receiving $2000. Notice that in choosing 1A over 1B, an expected utility maximizing individual reveals that the expected utility such person attaches to 1A is greater than or equal to the expected utility he attaches to 1B. That is,

$$0.9u(2000) + 0.1u(0) = 0.9u(2000) \tag{2.1}$$

$$\geq 0.45u(4000) + 0.55u(0) = 0.45u(4000) \tag{2.2}$$

indicating

$$u(2000) \geq 0.5u(4000) \tag{2.3}$$

Notwithstanding, in choosing 2B over 2A, an expected utility maximizing individual discloses that the expected utility he assigns to 2B is higher or equal to the expected utility he assigns to 2A. That is,

$$0.001u(4000) + 0.999u(0) = 0.001u(4000) \tag{2.4}$$

$$\geq 0.002u(2000) + 0.998u(0) = 0.002u(2000) \tag{2.5}$$

indicating

$$u(2000) \leq 0.5u(4000) \tag{2.6}$$

Unless the individual is indifferent, equations (2.3) and (2.6) cannot be applied at the same time. It follows that this way of choice cannot be consistent with the expected utility theory. If so, a person choosing 1A over 1B must choose also 2A over 2B. The point lies in the ratio of the probabilities attached to $4000 and $2000 respectively in two decision exercises. Within choice 1, the ratio is 0.45/0.9=0.5, while in choice 2, the ratio is 0.001/0.002=0.5. The expected utility theory states that choice is constant to common ratios, however, in practice people often break this assumption, giving rise to what is called the *common ratio effect*. The reason leading to this effect is that choices 1 and 2 relate to the different presentation of probabilities. Choice 2 features small probabilities, while choice 1 does not. It is supposed that the choice bias supposes that people tend to underweight the difference between a probability of 0.002 and 0.001, it seems to be irrelevant.

Kaheman and Tversky (1979) described also the *loss aversion*, as is shown by the following example, adapted again from Shefrin (2008: 399-400):

3. Consider the following choice:
3A: a sure $0;
3B: a 50% chance to win $10, a 50% chance to lose $10.

Most people prefer 2B to 2A, which leads to assumption that people are risk averse in case of gains and risk seeking in case of losses, while losses appear larger than gains of the same height.

Another significant effect described within the prospect theory is the *isolation effect*. Whereas the traditional approach assumes that framing is irrelevant to the decision-making, Kaheman and Tversky (1979) use it to indicate the manner in which a decision problem is illustrated. Thus, traditional approach shows that people will act *as if* they framed choices involving risk, but if people did so, and avoided making stochastically dominated choices, then their behaviour would be in accordance to the maximization of expected utility.

The experimental conclusion, however, is that people are risk averse, when they are expecting gains, but in case of possible loss they become risk seeking, because they are isolating other variables than gain/loss information. However, when the choice is framed in context of gains, people make their decisions as if they are risk averse, on the other hand, when it is going about losses, people make their decisions as if they are risk seeking. This presumption forms the basis for formulating of the *disposition effect*, which has been described in the stock-investing context as a behavioral tendency of investors to hold on losing stocks

for too long and sell winning stocks too soon. When investment value (stocks, CFDs etc.) grows, investors are getting more and more risk averse together with increasing gain. Contrary, when are value of investments falling, investors are willing to take more risk and hope that it will increase again soon. They usually do not take into account the possibility of increasing loss over time.

Selected studies focused on the disposition effect

The prospect theory briefly described in the section above provided the basis for a study made by Shefrin & Statman (1985) called *The disposition to sell winners too early and ride losers too long: Theory and evidence*, where the disposition effect was named and described. They also suggested that during December it is easier for investors to control their risk-seeking attitude in context of losses, because they pay far more attention to the tax reduction activities, than investments.

This study was followed by many others, for example Odean (1998), who mentions self-control considering December but says little about regret. Fogel and Berry (2006) were also strongly supporting the importance of regret during explaining of the disposition effect, especially when it comes about losses. Lehenkari (2007), based on the Finnish data, provides evidence that investors are more prone to succumb to disposition effect for stocks they purchased than for stocks they received for free (as a gift, inheritance etc.). Barberis and Xiong (2009) investigated whether prospect theory preferences can predict a disposition effect; Kaustia (2010) included the chapter focused on the disposition effect into the book Behavioral Finance: Investors, Corporations, and Markets. In the Choe and Eom (2009) it was examined, whether the disposition effect exists in the Korean stock index futures market.

Moreover, there are many studies focused on examination of the gender differences in the trading approach. For example, Jacobsen *et al.* (2014) compared the optimism of males and females in many fields including the economy and financial markets. According to his research males tend to be significantly more optimistic than women. Halko *et al.* (2012), Dwyer *et al.* (2002) and Barber and Odean (2000) confirmed that females are more risk averse than males. Furthermore, Nicolosi *et al.* (2009) confirmed that traders are able to learn and improve their trading skills based on experience.

Methodology

The dataset used in this study, was collected by Jochec (Dvořáčková and Jochec, 2018) during his lectures in various world countries over the last decade. Students were trading on the OANDA FX Trade Practice platform with currency pairs and CDFs. Initially, the students were given 100 000 USD and the trading

period was standardized for three months. Each student received unique account so that it was not possible to change the account later, reset the losses, use more accounts, etc. As those students did not trade with real money, they were motivated to achieve as good result as possible by a financial reward and extra points for the exam for the winner (student with the highest account balance at the end of the trading period). One of the learning objectives was to experience first-hand currency trading. At the end of the trading period students had to submit their trading history together with a short questionnaire and demographic information. Based on the collected information a unique dataset of experimental trading data linked to a unique account (an individual student trader) were created. Over the time, 292 students were involved in the game and they made 12 416 trades with the total volume of over three billion units in total. Among them, 43% (125 students) became profit makers. That is to say that their account balance at the end of the trading period was higher than 100 000 USD. Regarding the gender diversity of traders, 120 females and 172 males were involved. Overall, there were 29% of trades made by females and 71% by males. The proportion of profitmakers was slightly higher for females than males.

The setting of the game in the currency markets is convenient; currency markets are liquid and close to efficient. It is difficult to make meaningful price predictions and trading is more a matter of luck then skill. Thus, the skill component does not distort the picture and the trading patterns and strategies tend to be more behavioral in nature.

The data generation and collection process proceeded as follows: The course was started with a series of lectures and assignments designed to explain the currency trading basics and the use of the trading platform. The game was launched sometime in the second to fourth week, and was running for the rest of the semester (60 to 90 days). Soon the focus shifted on the other topics and the game continued in the background. The rules and the interference with the students were minimal, students were not asked for any specific strategy, neither encouraged nor discouraged the use of fundamental or technical analysis; there was no “desired” amount, frequency, size, or currency of trades. The winner was the student with the highest trading account balance in the end. The ending profit or loss did not affect the course grade except that the winner (and only the winner) earned few extra points towards the final course grade and in some cases a voucher to a bookshop.

The experimental setting has obvious disadvantage that the money is not real and thus the joy of winning (pain of losing) is moderated. This should be slightly counteracted by awarding the winner. The counterargument might be that the “winner takes it all” reward scheme is problematic, there is no incentive for scoring second (third...); similarly, scoring low does not bear any penalty. This and the fact that it is hard to predict currency rates even for professional traders, means that those students were in effect encouraged taking higher-than-normal risk and engaged in “all or nothing” gamble. It was not possible to rule those problems out; however, there is no indication of more frequent occurrence of large bets on the last

few days of the game, which would pointing out a tendency towards pure gambling. It can be assumed that the students derived some benefits also from simply doing well, even if not the best. This could result from the long-term continuance of the experiment and the psychological benefit (cost) of favourable (unfavourable) comparison with the peers, and, perhaps most importantly, by keeping the current winner and his/her balance at strict confidentiality. This conjecture is supported by student comments and informal feedback. The assumption is, that in spite of the singular incentive, the students chose investment strategies without trying to "game the system" or engaging in an ultimate all-deciding gamble. The indirect evidence will be shown in subsequent chapters.

One can identify various advantages of the experimental setting; firstly, participants do not self-select into roles and thus the sample is less biased: take, for example, an effect of gender on trading decisions. To compare behavior of actual female and male traders is problematic because the female traders might have some male characteristics, which made them to select the trading profession and helped them to succeed in it (self-selection and survivorship bias). The sample of students/traders does not represent the population ideally, because all of them decided to study business, but not all of them would like to do the trading career. Second advantage of the experimental setting is the homogeneity of objectives. In real situation, someone might set up a currency position as a hedge for some other asset. For example, if somebody's savings are predominantly in Euros but expected spending in dollars, that person might want to open a short position in EUR/USD in order to hedge the Euro exposure in the savings account. The loss on currency position offsets the gain on the savings account (and vice versa), thus decreasing the volatility of wealth. In case that the real traders behavior is analysed, their goals are not known, are they speculating or hedging? Different objectives would lead to different trading strategies. Moreover, in the real life, trader's wealth is given by the sum of different assets, therefore a loss in Oanda may be compensated by gain in another asset, and a high net asset value person may trade differently from a low net asset value person.

In spite of not being offered monetary compensation, the data shows that students took the trading game seriously. It is supposed that it was partly caused by the fact, that students found the game interesting, as shown by the questionnaire result, 75% of students answered that they traded because it was a course requirement and also interesting for them, 5% traded because it was purely interesting and 20% of students traded only because it was a course requirement. According to another question, 44% of students actually had at least some feelings of addiction during the game. Figure 1 hereof shows answers to question from the questionnaire regarding the subjective feelings of addiction on trading. It is apparent that males tended to feel addiction to trading more often than females, which goes together with Tavares *et al.* (2001), telling the emergence of male's addiction on games is much faster than females.

Figure 1: Subjective Feelings of Addiction for Females (left) and Males (right)

Students were strongly self-motivated partly because they played the game while being introduced to the world of international finance as the course progressed (thus seeing its relevance and connection with the real world). The other part of their motivation could have been the peer pride. Students were often discussing their trading success and failures or boastfully showing others their impressive results on their Oanda-enabled smart phones. The fact that they competed with and benchmarked their results against their classmates and friends over an extended period possibly made the game more interesting (compared to some short laboratory experiment with strangers).

Results

Within this section we provide the key findings. First, general presence of the disposition effect is examined and closely related questions are discussed; subsequently, the disposition effect is analyzed from gender perspective; finally, the relationship between the size of the trade and the disposition effect is studied.

Presence of the disposition effect within the data set

For the analysis purposes all actively closed trades with the absolute value of profit/loss at least $1 have been used. For the individual traders' analysis at least ten such trades throughout the entire game are required. Actively closed trade is a trade that was closed by the student action and not by the system (a trade may be closed automatically if a stop loss or take profit order is attached to it). The

requirement of at least ten trade´s filters out less active students who might have not enjoyed the game and played it only formally, as it was a course requirement.

Out of about 13,000 trades in the dataset, 5,300 (40%) used attached stop loss or take profit orders, the remaining 7,700 (60%) were actively closed. Out of all trades, 1 500 had profit/loss smaller than $1. Applying both filters simultaneously, 6 500 trades were obtained. Out of almost 300 traders, 160 traders had both profitable and unprofitable trades and ten or more trades with profit/loss at least $1.

Average profit on a trade is $850 (on average trade size $800K, or 0.1%), where average loss on unprofitable trades is $ 2,400 and average profit on profitable trades is $2 450. *Figure 2* shows histogram of profit/loss for 6 543 actively closed trades with profit/loss higher than $1. A relatively high positive average profit is a result of applying two data filters; firstly, only actively closed trades (average Profit/Loss on all trades with P/L larger than $1, closed actively or through take profit and stop loss orders, is $650); secondly, system issued margin closeouts were excluded, which, if included, make average P/L per transaction negative $120 (there were 520 trades closed in margin closeouts, with average P/L $ -18,000).

Margin closeout is the broker's way to ensure that a client has sufficient funds to cover the losses (positive Net Asset Value) in case of adverse price trend. In the case of Oanda, the margin closeout is issued if the margin used by all open positions becomes higher than trader's NAV multiplied by two. This happens when the unrealized P/L on open positions sufficiently deteriorates as a result of unfavorable move in exchange rate. When margin closeout happens, all positions are closed. This always results in a substantial aggregate realized loss, and such losses were excluded from the data set. The negative $120 average P/L is close to zero (.015% of the trade size), as expected in an uninformed zero-sum game. Slightly negative result is consistent with the presence of transaction costs.

The first question we are going to discuss is whether *the disposition effect was observed overall.* As already mentioned, the disposition effect has been confirmed by many studies in the past (see, e.g., Barberis and Xiong, 2009; Choe and Eom, 2009; Marciukaityte and Szewczyk, 2012). We show that our studies is not an exception. In Table 1, the number of trades, average holding period in days and timeLtoP (ratio of the average holding period of unprofitable trades to average holding period of profitable trades) for profitable/ unprofitable actively closed trades with profit/loss $1 and higher are depicted. The reported *p*-values are for independent two-sample *t*-test for the difference in means, assuming unequal variance.

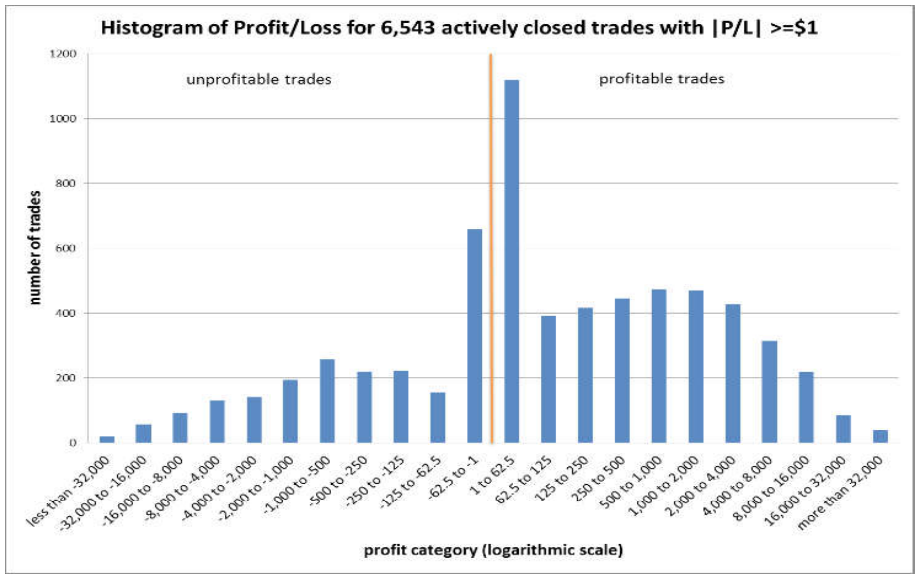


Figure 2: Distribution of the P/L on a Trade

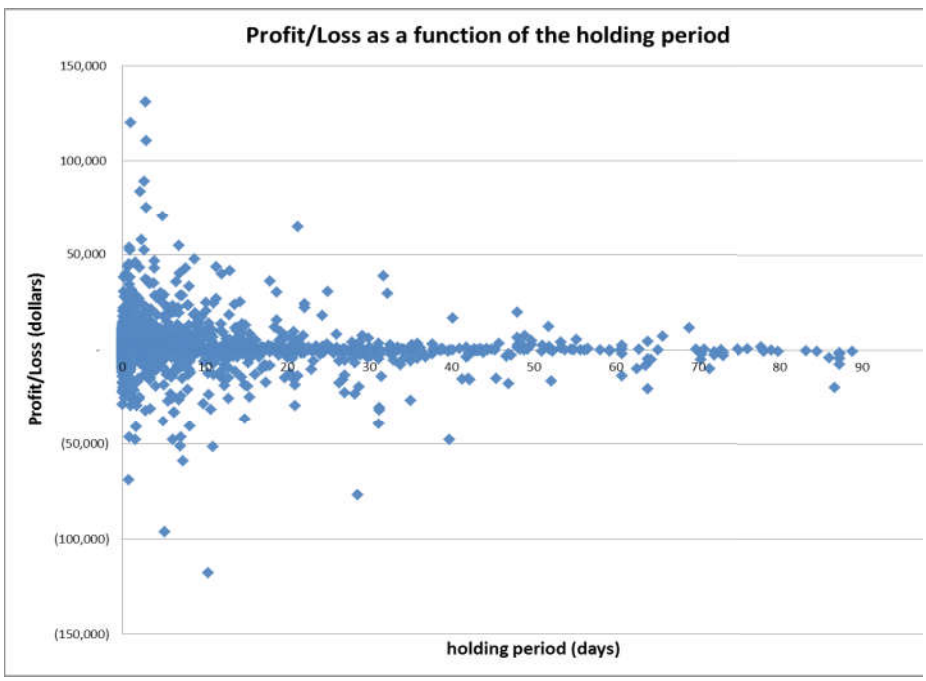


Figure 3: Profit/Loss Function of the Holding Period

Obviously, there is a disposition effect in all three specifications, resulting from the fact that the average holding period of unprofitable trades is significantly longer than that of profitable trades. Looking at the basic mean, the average holding period for profitable trades is 3.4 days, whereas for unprofitable trades it is 5.5 days, which is higher by 62%. Concerning the mean, weighted by P/L, the difference is even more significant. Traders in average held profitable trades 4.4 days, but unprofitable trades 10.5 days, which is 2.4 times longer holding period. According to this result, it is assumed that students took the trading seriously and they were afraid of big losses. The last category, average holding period weighted by the trade size also shows the presence of the disposition effect. The unprofitable trades holding period (1.9 days) is by 26% higher than for profitable trades (1.5 days).

Table 1: Holding Period of Trades

	N	mean (days)	mean, weighted by |P/L|	mean, weighted by trade size
profitable trades	4 400	3.4	4.4	1.5
unprofitable trades	2 100	5.5	10.5	1.9
all trades	6 500	4.1	6.2	1.6
p-value (mean difference)		<.0001	<.0001	0.004
timeLtoP		1.6	2.4	1.3

The next question, which should be answered here, is whether *thetraders who have generated profits so far feel less pain from unprofitable trades, and thus close them faster*. Impact of NAV at trade's close on disposition effect is shown in *Table 2*. This table explores whether the decision to keep a particular trade open or to close it depends on whether the trader is overall at a profit or loss at a moment of trade's close.

Table 2: Holding Period of Trades according to the NAV

	Traders at overall profit at the moment of trade's close		Traders at overall loss at the moment of trade's close	
	N	Mean (days)	N	Mean (days)
Profitable trades	3 000	3.5	1 400	3.2
Unprofitable trades	900	5.4	1 200	5.6
timeLtoP		1.5		1.8

The answer to the question is yes, it seems so, albeit marginally. Holders of profitable accounts tend to keep their profitable trades in average for 3.5 days and their unprofitable trades for 5.4 days, while holders of unprofitable trades have shorted holding period of profitable trades, 3.2 days (they are probably more risk averse and more afraid of another loss) and longer holding period of unprofitable

trades, which is 5.6 days. The timeLtoP is 1.5 for holders of profitable accounts vs 1.8 for holders at overall loss, which is 20% higher.

Disposition Effect and Gender

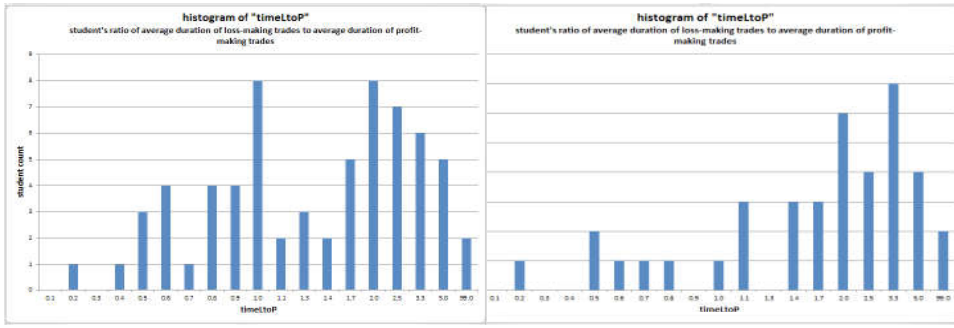
In this part the difference in the disposition effect bias with respect to the gender of trader is examined. *Table 3* shows the length of trades for males and females and it is obvious that females tend to the disposition bias much more than males, they held loss trades more than two times longer than profitable trades. Contrary males held unprofitable trades only 1.3 times longer than those, which were profitable.

Table 3: Holding Period of Trades according to the gender

	males			females		
	N	Length of trade (days)	Avg. size	N	Length of trade (days)	Avg. size
Profit	3 200	2.5	$1M	1 200	5.8	$350K
Loss	1 600	3.2	$850K	600	12.3	$200K
timeLtoP		1.3			2.1	

Following *Figure 4* shows histograms of timeLtoP (ratio of the average holding period of unprofitable trades to average holding period of profitable trades) for males and females and it is again clear that the timeLtoP of females is much longer than of males. While most male students had the timeLtoP 1.0 and 2.0 days, the most females report the timeLtoP 3.3 days and 2.0 days.

Figure 4: Histogram of timeLtoP for males and females



Regarding the *Table 3*, the average size of the trades is reported as well so that significant difference between different gender scan be observed. The average size of profitable trades of males is 1M$, which is almost three times more than the average size of female´s profitable trades (350k$). The average size of loss trades of males and females is 850k$ and 200k$, respectively, which leads to the presumption that females are much more risk averse than males. As students had to fill in a questionnaire, which involved also one question regarding to the risk attitude, it is possible to compare their answers to the real numbers.

Accordingly, males involved in the research tend to behave more risky than females. From the total number of respondents, 46% of females stated that they do not enjoy taking risk; the same answer gave only 26% of males. On the other hand, 41% of females confirmed enjoying taking risk, the same answered 60% of males. This result is consistent with the studies by Halko, Kaustia, & Alanko (2012), Dwyer, Gilkeson, & List (2002) and Barber & Odean (2000), who confirmed that females are more risk averse than males. The subjective approach to the risk goes also together with the Jacobsen *et al.* (2014) and the optimistic approach of males. Note finally that looking at the results of the questionnaire and results of trading, they are in accordance, as it is obvious that males take much bigger trades and are less afraid of loss than females.

Relationship between the size of the trade and the disposition effect

The last question discussed here is whether *the disposition effect relates to the trade size*. The initial presumption is that the biggest trade, the more significant tendency for the disposition bias. *Figure 5* shows a histogram of trade sizes, which is, for most trades between 1M$ and 2.05M$. Additional information about the holding periods of trades, divided into two groups (below average and above average) is reported in *Table 4*.

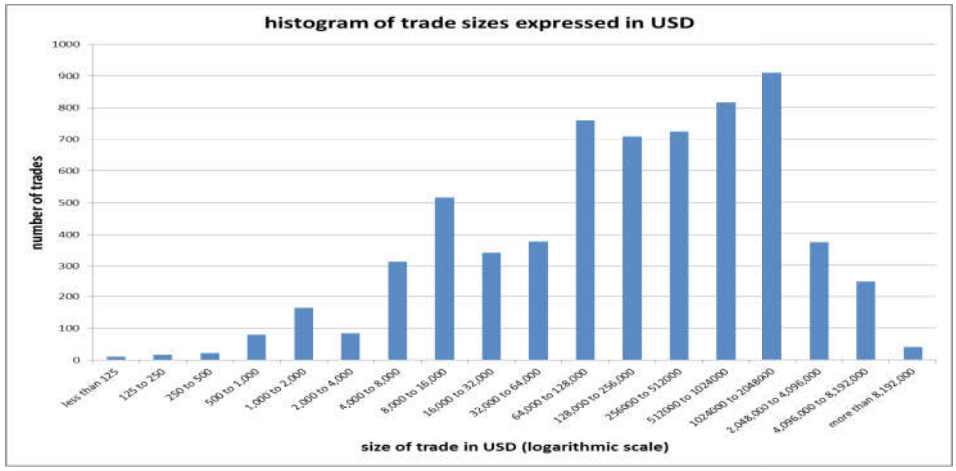


Figure 5: Histogram of Trade Sizes in USD

Table 4: Holding Period of Trades with respect to the trade volume

	small trades (below average)			large trades (above average)		
	N	Length of trade (days)	Avg. size	N	Length of trade (days)	Avg. size
Profit	3 100	4.2	$200K	1 300	1.5	$2.5M
Loss	1 600	6.8	$160K	500	1.4	$2.4M
timeLtoP		1.6			0.9	

Disposition effect seems to disappear in trades with above average size (roughly upper quartile). Large trade sizes are usually used for minute-trading (small trades would result in insignificant results). If a trader plays on volatility and engages in minute trading, his/her trades will tend to be short in duration, both profit-making and loss-making ones, actually unprofitable trades are in this case held for shorter time than profitable ones. The time to P for small trades is 1.6 days, whereas for large trades it is only 0.9 days.

Conclusion

The disposition effect has been described in the stock-investing context as a behavioral tendency of investors to hold on to losing stocks for too long and sell winning stocks too soon. In this paper the disposition effect was confirmed also in the experimental student game of currency trading data set. The presence of the disposition effect leads to the conclusion that students, despite using demo money, were trading with real behavioral bias. Moreover, interesting findings concerning gender differences and size of the trade were discussed, providing relatively strong evidence on differences between females and males.

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