The Effect of Induced Mood on Prices in Experimental Asset Markets

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Abstract

In this paper we study the effect of induced positive mood on price patterns in experimental asset markets. Smith, Suchanek and Williams (1988) in their seminal paper documented bubbles and crashes in experimental asset markets (i.e., prices exceed fundamental value in the beginning and fall towards or below the fundamental value towards the end of the market). Since then, a number of studies have shown that the magnitude of the bubble is influenced by experience, the ability to buy on margins and sell short. We believe that price patterns will also be influenced by affect. We use call trading market rules in our experimental asset markets. As expected, our results show a higher deviation of prices from fundamental values under positive affect treatment.

1. Introduction

There is sufficient evidence from studies done previously that indicates mood has an effect on decision-making in asset markets. For example, Saunders (1993) using weather on Wall Street as a proxy for mood shows that "security markets are systematically affected by local weather".[1] Likewise, Hirshleifer and Shumway (2003) take this research a step further and examine the relationship between mood, again using sunshine as a proxy variable, and daily market index returns across a sample of 26 countries over fifteen years. They report mood to be strongly significantly correlated with stock returns. Similarly, Kliger and Levy (2003), using risk preferences from capital market data find that positive (negative) mood is associated with investors being less (more) willing to tolerate risk. Using a different proxy for mood effects, Edmans et al (2005) relate sports sentiments to stock returns and report that there is a significant market decline after soccer losses. They also report the same findings for other international games such as cricket, rugby and basketball. And finally, Yuan et al (2006) make an argument to use lunar phases as a proxy for mood effects and report results from a sample of forty eight countries and find that stock returns vary significantly depending on the lunar cycle. All these studies make a convincing argument that mood indeed affects decision making in asset markets. However, to date there has been no research done to our knowledge that directly studies the impact of mood on behavior in asset markets in a controlled environment. In fact, existing literature points to the need for this type of study. For example, Lucey and Dowling (2005) in a survey of the literature on investor-feeling and equity pricing call for the investigation of emotions on investor

[1] Saunders (1993) pp. 1337.

decision-making using "…alternative investigative tools, such as…laboratory experiments."[2] As another example, David Hirshleifer (2001) in a survey on investor psychology and asset pricing concludes that "It is often not obvious how to translate preexisting evidence from psychological experiments into assumptions about investors in real financial settings. Routine experimental testing of the assumptions and conclusions of asset-pricing theories is needed to guide modeling."[3] And likewise, Hirshleifer and Shumway (2003) in examining the relationship between stock returns and weather conclude that "A useful direction for future experimental research will be to examine the effects of mood…on trading behavior."[4] Thus, our paper fills this important gap in the literature by studying *directly* the effect of induced positive mood on bubbles and crashes in asset markets in a controlled environment, as has been called for by many researchers. It is important to mention here that the present paper is an exploratory study and the data is limited to the extent that conclusive inferences cannot be drawn at this stage. Nonetheless, the results are suggestive of mood effects and they validate the need for further research along the same lines.

An increasing number of studies in the experimental economics literature have documented mood effects on decision making.[5] With researchers finding the presence of mood effects in simple one-shot games, attention in the literature turned to more complex decision making environments. For example, Bosman and Reidl (2004) induced mood in a first-price auction. Capra et al (2006) test the effect of induced positive and negative

[2] Lucey and Dowling (2005) pp.231.
[3] Hirshleifer (2001) pp. 1577.
[4] Hirshleifer and Shumway (2003) pp. 1029.
[5] See for example Capra (2004), Kirchsteiger et al (2006), Bosman and Riedl (2004), Charness and Grosskopf (2000).

mood in a random n^{th} price auction and find that subjects submit bids that are significantly higher than their induced values under positive mood.

Similarly, there is a stream of research in behavioral finance literature that investigates the impact of investor sentiment on asset pricing. In fact, some researchers believe that psychological influences have a big role to play, especially during periods of mania or panic in the market.[6] And these studies make a convincing argument, given the overwhelming body of literature that shows mood to influence cognition, judgment, risk-taking behavior, probabilistic inference[7] – all of which play a key role in making decisions in the asset market. Given the mood effects that have been documented in other markets, our paper seeks to study the effect of induced positive mood on price patterns in experimental asset markets.

Experimental asset markets have been studied extensively in the literature. Smith, Suchanek and Williams (1988) were the first to document the existence of price bubbles in a double-auction environment where agents faced identical uncertain dividend payout schedules. Bubbles are defined as persistent deviations of prices from fundamental values (which are determined by the expected dividend stream of an asset share). Smith et al. observed price bubbles followed by crashes repeatedly. Since this seminal work, there has been an explosion in the field of experimental asset markets with researchers varying characteristics of the market and testing the robustness of the bubble-crash phenomenon. Among many interesting studies, a few that are relevant to our research are mentioned here. Dufwenberg, Lindqvist and Moore (2005) test the effect of experience in

[6] Hershleifer (2001) provides a survey of the theory and evidence regarding investor psychology as a determinant of asset pricing. Similarly, Lucey and Dowling (2005) also provide a survey of existing research on the influence of feeling on investor research and equity pricing. See also, Dremen (2001) Slovic (2001) Dremen and Lufkin (2000), Ackert et al (2003).
[7] Isen (2000), Johnson and Tversky (1983).

experimental financial markets. King et al (1993) found the bubble-crash phenomenon to be robust to various factors such as margin buying, short selling, identical endowments, limit price-change rules, informed insiders and brokerage fees. Similarly, Noussair and Haruvy (2006) report that relaxing short-selling constraints does not make prices track fundamental value of assets. Finally, Van Boening et al (1993) show that the bubble-crash phenomenon is not eliminated by using call market trading rules.

At first glance, it may seem that the results of most of the studies reported above give a clear indication of the expected effect of positive mood – we should expect to see some sort of 'market exuberance' (i.e. bigger bubbles in the positive mood treatment as compared to the neutral treatment). However, delving into psychological research on mood effects gives us quite a diverse set of findings. For example, it has been found that happier people are more optimistic and that they assign higher probabilities to positive events (Wright and Bower 1992). However, Isen et al (1988) show that even though happy people are more optimistic about their likelihood of winning a gamble, they are in fact *less willing* to take the gamble (i.e. they are more risk averse). This risk aversion can be explained by the mood maintenance hypothesis which posits that people in a good mood do not want to take action to jeopardize their current affective state. With respect to asset markets, this implies that participants under induced positive mood, due to their increased risk aversion, may not place as high or as many bids as they would in some other affective state.[8] Other studies find that good mood is associated with less critical mode of information processing (Schwartz, 1990) so it may be possible that subjects would concentrate less on the fundamental value of the asset and trade at higher prices,

[8] Fellner and Maciejovsky (2002) in a study on risk attitude and market behavior in experiment asset markets show that the higher the degree of risk aversion, the lower the observed market activity.

which could result in larger bubbles. Thus, while the studies quoted above that use aggregate data to study the impact of mood on investor decision-making are certainly informative as to what kind of an effect should be expected, they are not a definitive guide due to the presence of the varied results from psychology literature, as noted above. Thus, the purpose of this paper is to find if induced positive mood in experimental asset markets will generate price patterns that are consistent with what may be called the 'market exuberance' hypothesis.

The rest of the paper is organized as follows. The proceeding section explains the experimental design and procedures. Section three presents the results. The discussion follows in section four.

2. Mood Induction Procedures

Mood induction procedures (MIPs) are widely used by psychologists to analyze the influence of affect on cognition, memory, problem solving, and recently by economists to analyze the effect on decision-making in games (see Capra, 2004 and Kirchsteiger et. al, 2006). While developing effective mood inducing techniques in the laboratory, one must be careful about choosing methods that are hedonically relevant, but productive of a low intensity affect. An effective mood inducer should cause a person to access thoughts that are of similar hedonic tone as the mood. Thus, most effective MIPs use recollection or imaging of emotional events. These include: 1) The Velten procedure: subjects read suggestive neutral, positive or negative statements and are asked to imagine themselves in a certain mood. 2) Hypnosis: subjects are hypnotized and asked to assume

a particular mood. 3) Memory elicitation (autobiographical recollection): subjects are asked to recall and write about a sad or happy event from their lives, 4) Employment of mood-inducing audiotape or videotape, and 5) Experience of success/failure during experimental paradigms (feedback).[9]

We used emotion elicitation using emotional films in our experiments. This method is among the most popular and effective emotion-elicitation methods[10]. A number of studies have discovered strengths of this method when looking at the efficacy of numerous procedures. Exposure to emotional film excerpts seems to possess several major advantages. It is one of the most easy-to-use techniques of emotion elicitation. It has been widely observed that film excerpts can elicit strong subjective and physiological changes (e.g. Frazier, Strauss & Steinhauer, 2004; Gross, 1998; Palomba, Sarlo, Grilli et al., 2000). Moreover, it seems to be the most powerful technique to elicit emotion in a laboratory. For example, a meta-analysis on the effectiveness and validity of MIPs by Westermann et al. (1996) find that the effects of using videotapes or films are the strongest in inducing positive affect. To induce positive affect, we used a film clip from Jerry Seinfeld's stand-up comedy. The results of mood induction detailed in section three show that this clip proved effective in eliciting emotions.

[9] A number of psychologists have also used unexpected gifts as a way to induce positive mood for example Isen and Geva (1987) give subjects a small bag of candy and show that gifts are an effective way of making people feel elated. We disfavor this method, however, as it disrupts the relationship between experimenter and subject.

[10] See for instance Gross and Levenson (1995) and Schaefer, Nils, Sanchez and Philippot (submitted manuscript).

3. Experimental Design and Procedures

The data were gathered in four experimental sessions conducted at Emory University, located in Atlanta, Georgia, USA. All participants were undergraduate students who were inexperienced in asset market experiments. There were two sessions each for the neutral and positive mood treatments. Nine subjects participated in each session, and no individual participated in more than one session. Each session lasted approximately one hour, including the first 30 minutes during which the experimenter read the instructions. Earnings averaged 15 US dollars per subject. In each session, a 15 periods market was operated. In that market, participants could trade an asset with a life of 15 periods. Each of the nine participants possessed an initial endowment of 100 experimental dollars in cash and 3 units of the asset at the beginning of period 1. Within the market, individual inventories of asset and cash balances carried over from one period to the next. That is, the quantities of cash and assets an individual had at the end of period t after the dividend had been paid equaled his quantities of cash and asset at the beginning of period $t+1$. The exchange rate of experimental currency to US dollars was 10 experimental dollars of earnings in the markets to 1 US dollar of compensation to the participant. The market was computerized and used call market trading rules implemented using the *veconlab* software, developed by Charles Holt at the University of Virginia (http://veconlab.econ.virginia.edu/login.htm).

At the end of each period, each unit of the asset paid a dividend of 0, 0.5, 1, 1.5 or 2 experimental dollars, each with equal probability. The dividend was independently drawn for each period. The distribution of the dividends and the fact that the expected

dividend was 1 experimental dollar per period were common knowledge among the participants.

A market for the asset operated each period. The market employed call market rules (as in Friedman, 1993; Van Boening et al., 1993; Cason and Friedman, 1997). In a call market, all submitted bids and asks in a period are aggregated into market demand and supply curves, and the market is cleared at a uniform price for all transactions of that period.

In each period, each participant had an opportunity to submit one buy order and one sell order to the market. An individual's submitted buy order consisted of only one price and a maximum quantity the individual was willing to purchase at that price. Similarly, his sell order consisted of only one price and a maximum quantity the individual offered to sell at that price. Individuals did not observe any other agents' orders for the period when submitting their own orders. After all of the participants submitted their decisions, the computer calculated the *market* price, the equilibrium price in the intersection of the market demand and supply curves constructed from the individual buy and sell orders. Participants who submitted buy orders at prices above the market price made purchases, and those who submitted sell orders at prices below the market price made sales. Any ties for last accepted buy or sell order were broken randomly. Participants were not permitted to sell short or to borrow funds.

To induce mood, video clips were shown to the participants between the instructions phase and the first trading period. The sessions were divided into two different treatments, differing by the mood induction. In the positive treatment, the participants watched a five minutes clip from the Jerry Seinfeld show in Broadway and in

the neutral treatment, no clip was shown. Upon their arrival, participants were asked to fill a survey. In this survey we elicited their demographic information and initial mood scores. Participants were asked to rate how they felt by marking on a ruler where one end corresponded to ‘very happy/in a very good mood’ and the other end corresponded to ‘very unhappy/in a very bad mood’. The ratings were then compared to an 8 point Likert scale to assign mood scores. The survey was conducted twice: upon arrival and immediately after the clip.

The information provided to each individual at the end of each period consisted of the market price, the dividend, the number of units of asset he acquired and sold, his current inventory of the asset, the cash he received from sales and spent on purchases, his current cash balance and the cumulative earnings for the session.

4. Results

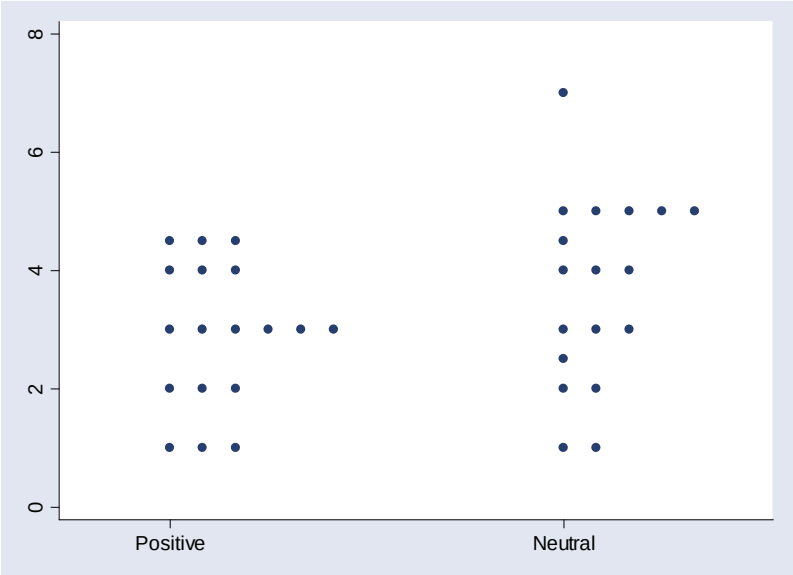
4.1 Mood Induction Results

Self-reports suggest that mood induction was successful for the induced mood treatment. The mean mood rates are 2.92 and 3.67 in the positive and control (neutral mood) treatments, respectively. Figure 1 depicts the distribution of scores for the overall emotional states after mood induction. It can be seen that the weight of the positive distribution is toward the lower end, which implies that subjects in an induced positive mood report a positive emotional state more frequently than subjects in the neutral mood. In addition, using the Mann Whitney test, we reject the null hypothesis of no difference

in self-reported mood across the two treatments (p = 0.062). Thus, at least as is reflected in the self-reported scores, mood induction was successful.

Figure 1: Distribution of Self-Reported Mood Scores after Mood Induction

(8 = very bad mood, 1 = very good mood).

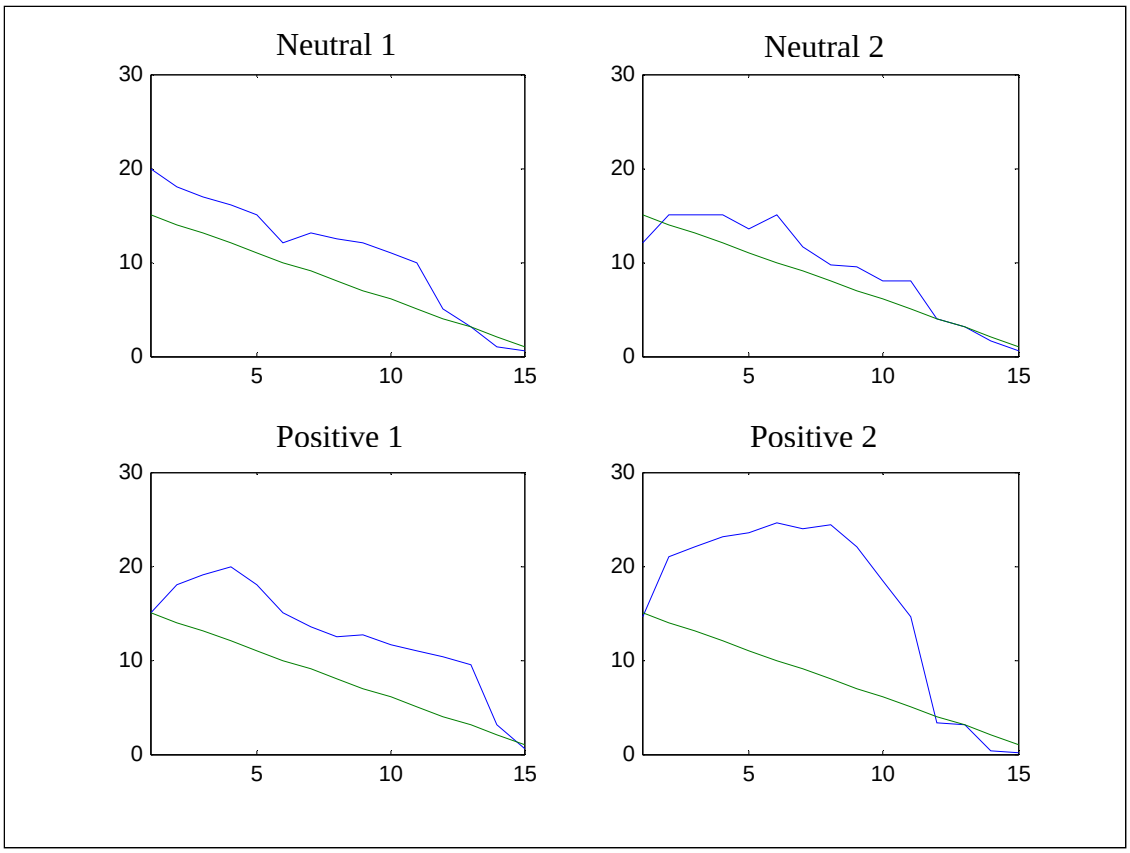


4.2 Price Patterns and Bubble Measures

As can be seen from Figure 2, the price patterns are similar to those observed in previous studies. In all sessions, market prices were above fundamental values almost throughout the market, which is consistent with the bubble-crash phenomenon. In figure 2, the two upper plots are the neutral treatments and the two lower plots are the induced positive mood treatments. It can be seen from the figure that the bubbles in the positive treatment (sessions 2, 3) are bigger than the bubbles in the neutral treatment (sessions 1,

4). This observation is consistent with the intuition that good mood contributes to higher prices.

Figure 2 – Price Patterns and Fundamental Values per Session (the upper plots are the neutral treatments and the lower plots are the positive mood treatments)



In order to compare the size of the bubbles, we use the bubble measures first described by King et al. (1993) and widely used by others (see Van-Boening et al, 1993, Haruvy and Noussair, 2005 and Haruvy et al, 2007 for examples). The bubble measures are used to test the robustness of bubbles to different treatments. We use these measures to test the magnitude of bubbles across the treatments.

The *total dispersion* is the sum of all the deviations from fundamental values over all periods. It is calculated as follows: $Total\ dispersion = \sum_t \left| P_t - f_t \right|$ where P_t is the market price in period t and f_t is the fundamental value of the asset in period t. *Total dispersion* always has a non negative value. The lower the *total dispersion* is, the closer the prices are to fundamental values, and the milder the bubble is. The higher the *total dispersion*, the higher the deviation of market prices from the fundamental values. The *total dispersion* by itself, however, can not tell us if prices are lower or higher than fundamental values in most of the time interval.

Another measure of the deviation of prices from fundamental values is the *average bias*. It measures the average deviation of prices from fundamental values throughout the time interval: $Average\ bias = \sum_t (P_t - f_t)/T$ where T is the total number of periods in the time interval. A value relatively close to zero means that on average, prices are relatively close to fundamental values. A high value implies that on average, prices are higher than fundamental values and a low (negative) value means that on average, prices are below fundamental values.

The *turnover* measures the trade volume during a time interval. It is calculated as follows: $Turnover = \sum_t q_t / Q$ where q_t is the number of shares traded in period t and Q is the total number of shares in the market. The *turnover* is non negative. A low value of *turnover* implies that the time interval is characterized by low trade volume. A high value means high trade volume. In experimental asset markets with 15 periods, a high *turnover* is generally associated with a higher bubble, and a low *turnover* with the tracking of fundamental values. The *amplitude* measures the magnitude of prices in a time interval. It describes the difference between the highest price and the lowest price (relative to

fundamental values) over the course of the market. $Amplitude = \max_t (P_t - f_t)/f_t - \min_t (P_t - f_t)/f_t$. High *amplitude* implies a higher bubble, while low *amplitude* implies a bubble with a lower magnitude. *Amplitude* is always non negative. The *normalized deviation*, like *total dispersion*, measures the deviation of prices from fundamental values. But unlike total dispersion, the normalized deviation takes into account the number of transactions in each period. Thus, periods with higher trade volume are weighted more in the aggregation of the price deviation over time[11]: $Normalized\ deviation = \sum_t |q_t (P_t - f_t)|/(100 * Q)$. The lower the *normalized deviation* is, the closer the prices are to fundamental values, and the milder the bubble is. The higher the *normalized deviation*, the higher the deviation of market prices from the fundamental values. The *normalized deviation* is non-negative. The *boom duration* is the highest number of consecutive periods with prices above fundamental values. The higher this value is, the higher the magnitude of the bubble.

Table 1 reports the average value of the bubble measures for each treatment. and the p-values for the differences between the averages of the measures for positive and neutral treatments respectively[12]. Consistent with figure 1, all bubble measures of the positive treatment are higher than the measures of the neutral treatment. Amplitude, the measure of magnitude of prices in a time interval, is 2.85 for the positive treatment, compared to 1.30 for the neutral treatment. Normalized deviation, the measure of the deviation of prices from fundamental values, is 8.23 for the positive value, which is much

[11] In experiments that use the continuous double auction, the normalized deviation is calculated as: $Normalized\ deviation = \sum_t \sum_i |P_{it} - f_t|/(100 * Q)$ where P_{it} represents the price of the *i*'th transaction in period *t*.

[12] We conducted a t test to test the hypothesis of no difference between the average of the bubble measures of the positive treatment as compared to the neutral treatment.

higher than 3.23 for the neutral treatment. Total dispersion is also much larger for the positive mood treatment (98.34 compared to 39.13 for the neutral treatment) indicating that the prices under the positive mood treatment are farther from the fundamental values than under the neutral treatment. A value of the average bias relatively close to zero means that on average, prices are close to fundamental values. Average bias is 6.26 for the positive mood treatment whereas it is only 2.24 for the neutral mood treatment. We can see from the p-values reported in the third row of the table below that all the bubble measures mentioned above are significantly larger for the positive treatment than the neutral treatment.

Table 1 – Bubble Measures – Average Values by Treatment

Treatment	Turnover	Amplitude	Normalized deviation	Total dispersion	Average bias	Boom duration
Neutral	1.17	1.30	3.32	39.13	2.24	11
Positive	1.26	2.85	8.23	98.34	6.26	12
†P-values	0.385	0.015*	0.018*	0.091*	0.079*	0.404

†*One-tailed t-test between the neutral and positive treatments*

The bubble measures reported above can tell us about the magnitude of the price patterns observed under the two treatments. Indeed, as can be seen from table 1 and figure 2, prices and bubble measures are higher under the positive treatment. This suggests that when participants are induced with 'good' mood, perhaps their pricing behavior is influenced by their optimism. However, it is important to point out the higher magnitude of the bubble under the positive treatment does not imply that happiness is causing 'market exuberance'. In fact, it may be the case that exuberance in the market

causes bigger bubbles. We cannot make a conclusion about the direction of causality but we have sufficient evidence to conclude that induced positive mood is significantly correlated with bigger bubbles in experiment asset markets. The next subsection explores the mood effects on the willingness to pay and accept in detail.

4.3 The Effect of Induced Mood on the Willingness to Pay and Accept

Table 2 below exhibits the averages of the number of bids and asks across subjects for each treatment, along with the average of bid and ask prices. From the table it can be seen that the average of bid quantity is higher under the neutral treatment. On the other hand, the average bidding price is lower under the neutral treatment. This suggests that an induction of positive mood lowers the number of bids, but increases the willingness to pay. On the other hand, both the ask quantity and the ask price are higher under the positive mood treatment. Thus, not only do subjects under positive induced mood are willing to buy more units of the asset, but they are also willing to buy at higher prices. The last row of table 2 shows the p-values of the one-tailed t tests for the hypothesis of no differences in averages across treatments. We can see that the differences in the willingness to pay are significantly higher under the induced mood treatment. Table 2 also shows that the average of both number of offers (ask quantity) and the willingness to accept is lower under the neutral treatment. The p-values reported show that the differences in the willingness to accept, as the differences in the willingness to pay, are significantly higher under the induced mood treatment.

Table 2 – Averages of Quantities and Prices of Bids and Asks by Treatment[13]

Treatment	Bid quantity	Bid price	Ask quantity	Ask price
Positive	1.08	7.07	1.91	13.17
Neutral	1.66	5.26	1.41	10.23
†P-values	0.104	0.017*	0.062*	0.051*

†*One-tailed t-test between the neutral and positive treatments*

5. Conclusion

While we are aware of the limitations of the present study in that the number of observations is small, our paper is a first attempt in this field to study how induced positive mood affects price patterns in experimental asset markets. Our aim was to show how positive mood affects price patterns. A number of studies in the field of behavioral finance using aggregate data and proxies for mood have found there to be a significant effect of mood on investors decision-making including pricing of assets. These studies all called for a controlled environment research to test their claims. In order to study this effect, we used call market rules and induced mood using video film clips. Using self-report measures, we found that the results of our mood induction were successful. Our price patterns were similar to those observed in previous experimental studies on asset markets. We saw that the bubbles under our induced mood treatment appeared bigger than the bubbles in the neutral mood treatment. To compare the magnitude of these bubbles, we employed six measures that have been frequently used in previous studies. The results reported show that all of the measures are bigger for the induced positive mood. We then looked at whether these differences in bubble measures were significant

[13] These numbers are a mean of means. We averaged the bid and ask quantity and the bid and ask price by round and then averaged across each treatment.

and we found that indeed four out of six measures were significantly higher under the positive mood treatment. Moreover, once we looked into the individual bidding behavior we found that induced positive mood lowers the number of bids, but increases the willingness to pay. Together, these results suggest that induced positive mood does have an influence on price patterns in experimental asset market. In particular, positive mood leads to bigger bubbles. Our results are especially interesting since they are confirming some of the observations from the field rather than the norm of testing experimental results in the field. Nevertheless, the results reported here serve only as a first test of mood effects in experimental asset markets and there is a need for further research. Our results, however, have shown that experimental asset markets do show susceptibility to mood effects and that this is an area in which further research needs to be done. The first step would be to validate our results with a bigger subject pool and then extend the study to include other affective states. Moreover, in answering a question like this, further field studies could be especially useful and could help synthesize the results from the laboratory to what is observed in the real world.

References

Ackert, Lucy F.; Church, Brian K. and Deaves, Richard. "Emotion and Financial Markets." *Federal Reserve Bank of Atlanta Economic Review*, 2003, Second Quarter

Capra, C. Monica; Meer, Shireen and Lanier, Kelli. "The Effects of Induced Mood on Bidding in Random nth Price Auctions." 2006, Manuscript in submission.

Dreman, David. "The Role of Psychology in Analysts' Estimates." *The Journal of Psychology and Financial Markets*, 2001, 2(2), pp. 66 – 68.

Dreman, David N. and Lufkin, Eric A. "Investor Overreaction: Evidence That Its Basis Is Psychological." *The Journal of Psychology and Financial Markets*, 2000, 1(1), pp. 61 – 75.

Dufwenburg, Martin; Lindqvist, Tobias and Moore, Evan. "Bubbles and Experience: An Experiment." *The American Economic Review*, 2005, 95(5), pp. 1731 – 1737.

Edmans, Alex; Garcia, Diego and Norli, Oyvind. "Sports Sentiment and Stock Returns" (May 2006). *Sixteenth Annual Utah Winter Finance Conference.* Available at SSRN: http://ssrn.com/abstract=677103

Fellner, Gerlinde and Maciejovsky, Boris, "Risk Attitude and Market Behavior: Evidence from Experimental Asset Markets" (September 2002). Max Planck Institute for Research into Economic Systems, Papers on Strategic Interaction No. 34-2002. Available at SSRN: http://ssrn.com/abstract=390105

Gross, James J. and Levenson, Robert W. "Emotion Elicitation Using Films." *Cognition and Emotion*, 1995, 9(1), pp. 87 – 108.

Haruvy, Ernan; Lahav, Yaron and Noussair, Charles. "Traders' Expectations in Asset Markets: Experimental Evidence. "*American Economic Review*, 2007, 97(5), pp. 1901-1920.

Haruvy, Ernan and Noussair, Charles. "The Effect of Short Selling on Bubbles and Crashes in Experimental Spot Asset Markets." *The Journal of Finance*, 2006, LXI(3), pp. 1119 – 1157.

Hirshleifer, David. "Investor Psychology and Asset Pricing." *The Journal of Finance*, 2001, LVI(4), pp. 1533 – 1597.

Hirshleifer, David and Shumway, Tyler. "Good Day Sunshine: Stock Returns and the Weather." *The Journal of Finance*, 2003, LVIII(3), pp. 1009 – 1032.

Isen, Alice M. "Positive Affect and Decision Making." In M. Lewis and J. M. Haviland-

Jones, eds. *Handbook of Emotions. 2nd Edition*, New York: Guilford: 2000, pp. 417-435.

Johnson, Eric J. and Tversky, Amos. "Affect, Generalization and the Perception of Risk." *Journal of Personality and Social Psychology*, 1983, 45(1), pp. 20-31.
Kliger, Doron and Levy, Ori. "Mood-induced Variation in Risk Preferences." *Journal of Economic Behavior and Organization*, 2003, 52, pp. 573 – 584.

Lucey, Brian M. and Dowling, Michael. "The Role of Feelings in Investor Decision-Making." *Journal of Economic Surveys*, 2005, 19(2), pp. 211 – 237.

Saunders Jr., Edward M. "Stock Prices and Wall Street Weather." *The American Economic Review*, 1993, 83(5), pp. 1337 – 1345.

Schaefer, Alexandre; Nils, Frederic; Sanchez, Xavier and Philippot, Pierre. "A Multi-criteria Assessment of Emotional Films." *Manuscript submitted for publication*

Schwartz, Norbert. "Feelings as Information. Informational and Motivational Functions of Affective States." in R. Sorrentino and E.T Higgins, eds.: *Handbook of Motivation and Cognition* (Guilford Press, New York), 1990.

Slovic, Paul. "Psychological Study of Human Judgment: Implications for Investment Decision Making." *Journal of Psychology and Financial Markets*, 2001, 2(3), pp. 1601 – 172.

Smith, Vernon L.; Suchanek, Gerry L. and Williams, Arlington L. "Bubbles, Crashes, and Endogenous Expectations In Experimental Spot Asset Markets." *Econometrica*, 1988, 56(5), pp. 1119 – 1151.

Van Boening, Mark V; Williams, Arlington W. and LaMaster, Shawn. "Price Bubbles and Crashes in Experimental Call Markets." *Economics Letters*, 1993, 41, pp. 179 – 185.

Westermann, Rainer; Spies, Kordelia; Stahl, Günter and Hesse, Friedrich W. "Relative Effectiveness and Validity of Mood Induction Procedures: A Meta-Analysis." *European Journal of Social Psychology*, 1996, 26(4), pp. 557-580.

Yuan, Kathy; Lu, Zheng and Zhu, Qiaoqiao. "Are Investors Moonstruck? Lunar Phases and Stock Returns." *Journal of Empirical Finance*, 2006, 13, pp. 1 – 23.