

Firm Image and Individual Investment Decisions

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This paper documents the importance of firm image in individual investment behavior. We conduct three experiments designed to examine whether investment decisions are influenced by selective information disclosures that are intended to promote a positive or negative firm image. Importantly, the disclosures are not value-relevant. Participants actively make investment decisions that have real economic consequences. We find that participants invest more heavily in firms with a positive image than in firms with a negative image, controlling for industry membership and financial data. These results are consistent with economic models of choice that recognize that the financial outcome is not the only argument in a person's utility function.

Individuals making investing decisions face a daunting task. Thousands of stocks can be purchased and the information available is overwhelming. To simplify the task, they may tend to focus on a manageable subset of stocks. Recent evidence suggests individuals give more consideration to stocks brought to their attention via news reports, magazine articles, or personal communications. Such exposure provides a coarse basis for evaluation, allowing individuals to form a mental image of a company's stock as an investment vehicle.

Barber and Odean [2003] report that individuals are net buyers of stocks covered in the news. Their research suggests that individuals overvalue the importance of events that catch their attention (e.g., Odean [1999], Barber and Odean [2000]). Other studies indicate that individuals place undue weight on salient or prominent information, even when it is not diagnostic (e.g., Andreassen [1990], Legrenzi and Girotto [1993], Hsee [1998]).

Attention-grabbing or salient information may evoke affective reactions, which influence whether investors *like* a company. The initial impression or liking can shape individual assessments, and, in turn, guide information processing. If attention-grabbing information is positive (negative), investors may be predisposed to evaluate a company favorably (unfavorably), establishing a directional goal that affects subsequent cognitions and reasoning (Kunda [1987, 1990],

Loewenstein and O'Donoghue [2004]). Hence, individual investors may be drawn to companies characterized positively by the media or others and shun companies characterized negatively.

We investigate the effect of salient, attention-grabbing information on individual investment decisions in the laboratory. In our controlled setting, salient information is designed to evoke an affective reaction (positive, negative, or neutral), but it is *not relevant* for determining future stock price. That is, the implications of the information have already been impounded in the stock price. We directly test whether participant investment choices are swayed by such information.¹

Recent evidence suggests that investing in companies on the basis of favorable, attention-grabbing information is not necessarily prudent. Because publicly available information is impounded and reflected in the stock price, an individual's ability to profit from it is limited. Barber and Odean [2003] report that attention-grabbing stocks acquired by individuals subsequently underperform stocks sold by those individuals.² Barber, Heath, and Odean [2003] document that individuals do not improve their position by investing in companies that draw the attention of the investing public.³ Simply put, salient information may promote investment, but it may not be *wise* investment.

We focus on individual investors in our study because this subset of market participants is significant and potentially impacts stock prices (e.g., DeLong et al. [1989, 1990, 1991], Shleifer and Summers [1990], Shapira and Venezia [2001]). According to the New York Stock Exchange [2002], approximately 84 million individuals own stock directly or indirectly. Brennan [1995] argues that increased attention on the individual investor would enrich our understanding of financial markets and institutions. Bossaerts [2001] underscores the importance of properly modeling individual beliefs to appropriately characterize market

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outcomes (see also Daniel, Hirshleifer, and Subrahmanyam [1998], Hirshleifer [2001]). Examining the effects of salient, attention-grabbing information on behavior can yield important insights into belief formation, and *how* investment decisions are shaped.

The paper is organized as follows. The first section provides a framework to link affective reactions and decision making. Next we describe three experiments designed to assess the link between affective reactions and individual investment decisions. We present experimental results after each experiment is described. Lastly, we provide concluding remarks, with implications and directions for future research.

Framework

Affective Reactions and Decision-Making

Affect refers to the quality of a stimulus and reflects an individual's impression or assessment. Adolphs and Damasio [2001, p. 45] describe affect as a representation that incorporates the value of a stimulus or action to an individual. It can be characterized along a bipolar dimension, such as positive/negative or appealing/repulsive.⁴ Cognitively, perceptions encompass affective reactions, which subsequently guide information processing. Hence, affective reactions are inextricably linked to judgment and decision-making (Zajonc [1980]). A theoretical understanding of this linkage, however, is in its infancy.

Damasio [1994] offers a comprehensive account of the role of affect and emotions in decision-making. He argues that thought is made up of images that include perceptual and symbolic representations (see also Charlton [2000]). The images are marked by positive or negative feelings, which are linked to somatic or body states ("soma" is Greek for body). Damasio [1994] hypothesizes that somatic markers, which arise from experience, establish a connection at the neural level between an entity or event and the enactment of a body state, pleasant or unpleasant. In essence, affective reactions are cognitive representations of distinctive body states. The feelings are often very subtle and may even arise outside the level of consciousness (Kihlstrom et al. [2000]). Damasio [1994] suggests that individuals are attracted to stimuli associated with positive somatic markers, and steer clear of those associated with negative somatic markers.

Finucane et al. [2000] offer a similar theoretical account. They suggest that mental representations of objects and events are tagged to varying degrees with affect and stored in memory. The information is available for retrieval once a stimulus is encountered and associated links are activated. Objects or events that evoke

positive affective reactions are associated with other representations in memory that produce favorable outcomes: That is, an affective linkage is established between stimuli and stored representations (see also Gelernter [1994]).⁵

Finucane et al. [2000] conjecture that affective reactions may be a more convenient means to make a choice: Because they are readily available, they may be far easier than weighing the pros and cons. Consequently, individuals may use an affect heuristic in judgment and decision-making (see also Epstein [1994]).

The importance of affect in decision-making cannot be ignored. Researchers contend that affective reactions occur at a very early stage and are more basic than cognitive evaluations (Zajonc [1980, 1984], Bargh [1984], LeDoux [1996]). Findings suggest that when affective reactions and cognitive evaluations diverge, the emotional aspects tend to dominate (e.g., Ness and Klass [1994], Rolls [1999]). More strikingly, affective reactions can influence judgment and decision-making without being mediated by cognitive evaluations (e.g., Zajonc [1980, 1984], Schwarz and Clore [1983], Clore, Schwarz, and Conway [1994]). Neurological evidence is consistent with this assertion (LeDoux [1996], Servan-Schreiber and Perlstein [1998]).

Affect and Investment Behavior

In an efficient capital market as defined by Fama [1970, 1991], prices reflect all available information. Market prices result from the interaction of traders whose decisions are affected by their perceptions of the attractiveness of a stock. Of primary concern, therefore, is whether individuals' affective reactions accurately reflect a firm's future prospects and facilitate investment choice.

When evaluating a firm, investors have access to a great deal of information. Additionally, firms devote significant resources to promoting a positive image. For example, when its stock price tumbled after the Firestone tire recall, Ford Motor spent heavily on marketing to stop the consumer exodus (Taylor [2001]). Likewise, WorldCom ran a series of ads aimed at restoring its reputation after its well-publicized accounting scandal (Alsop [2003]). Holstein [2002] found that even during times of rising stock prices, Samsung put "serious money" into molding company perceptions. The media is another important source of information. In a recent study of stock price reactions to television news reports, Busse and Green [2002] concluded that prices respond within seconds to news reports.

Although studies of market efficiency can assess whether prices incorporate positive and negative news, without an experimental method we cannot investigate how individual decisions are influenced by information, especially when the disclosed information is *not* relevant for assessing the firm's future value.

Direct research on the role of affect in investment decisions is limited. MacGregor et al. [2000] find that certain industries evoke a strong positive or negative image, which affects investor assessments of performance and, thus, their willingness to invest in these industries. Note that investor assessments are poorly correlated with the average performance of firms in these industries and, hence, potentially hinder individual portfolio allocation decisions.

Kida, Moreno, and Smith [2001] document that, in a capital budgeting setting, participants are more likely to reject investments that evoke negative affective reactions. In another study, Moreno, Kida, and Smith [2002] report that affective reactions influence participant capital budgeting decisions. Specifically, participants do not necessarily choose the outcome with the highest expected monetary value due to affective considerations. These findings suggest that financial outcomes are not the only consideration in utility measurement.⁶ The results are consistent with a broad view of decision-making that incorporates the influence of affect on utility assessment.

For this study, we examine participants' portfolio allocation decisions among firms that evoke positive, negative, or neutral affective reactions. We provide participants with selected information disclosures that promote a certain image. But some of the information is not relevant for assessing future value. In designing the experiments, we carefully matched firms on other characteristics, such as industry membership and financial data, in order to eliminate potential confounds. Based on the research discussed earlier, we expect individuals to choose investment opportunities that evoke a positive affective reaction, and avoid those that evoke a negative affective reaction. We investigate whether participants invest more money in firms that have a more positive image than in firms that have a negative image, controlling for industry membership and financial data.

Research Method: Experiment 1

Overview

We conducted a one-shot "investment" experiment to examine the effect of firm image on investor portfolio allocation decisions. We manipulated the image variable within subjects. Participants were endowed with cash, and instructed to allocate the funds among the available set of investment opportunities. We generated a return for each stock that in turn determined the ex post observed stock price. We compensated participants based on their portfolio allocation decisions, the difference between their beginning and ending portfolio values.

Participants

We recruited twenty-four students from a medium-sized university. The students included undergraduates and graduates (masters), with the vast majority in at least their third year of university studies. Participants had a mean age of 21.8 years, and completed or were currently enrolled in an average of 2.8 finance courses. Ten participants (or 42%) previously traded securities or took part in the management of an investment portfolio.

Procedures

We conducted two experimental sessions, with ten and fourteen participants per session. At the beginning of each session, instructions were distributed and read aloud by an experimenter. Participants were endowed with \$1m, and instructed to allocate the funds among the set of available stocks. Participants could choose not to invest in a particular security, but short-selling was not allowed. They could also hold some or all of their endowment in cash. The return on monies allocated to cash, however, is zero (i.e., the risk-free rate of interest is zero).⁷

Participants were told that in the experimental setting, the returns to investing in common stock are uncertain. They were then given an information sheet for each investment opportunity (see the appendix). Each sheet included two paragraphs, the first describing the firm's operations, and the second providing specific, historical information. The second paragraph was constructed to evoke an affective reaction to the firm (i.e., to establish a positive, negative, or neutral image). Each information sheet also included the current stock price, year-end prices for the past four years, and current financial data, including revenues, assets, price-to-earnings ratio, and beta.⁸

The investment opportunity set included six firms, two from each of three industries: financial services, automotive, and telecommunications. The two financial services firms had a neutral image. For the other two industries, one firm had a positive image, and one a negative image. Within each industry, the firm pairs are such that the price-to-earnings ratio and beta are comparable.

The pattern of historical stock prices varied between industries. For the financial services and automotive industries, stock prices in prior years moved generally with the average market return as reflected by each firm's beta coefficient (discussed below). For the telecommunications industry, the same was true, with the exception of one prior year. For the firm with the positive image, an abnormally large price increase (25%) occurred in the preceding year. For the firm with the negative image, an abnormally large price decrease (20%) occurred two years ago. These large price

Table 1. *Investment Opportunity Set*

Firm Name	Industry	Image	Historical Stock Prices
First National Bank	Financial Services	Neutral	Consistent With Market
WC Financial	Financial Services	Neutral	Consistent With Market
Smithland Motors	Automotives	Positive	Consistent With Market
MMC Motors	Automotives	Negative	Consistent With Market
Metro Technologies	Telecommunications	Positive	Abnormal Price Increase One Year Ago
Power Resources	Telecommunications	Negative	Abnormal Price Decrease Two Years Ago

Note: The table provides information on the available investment opportunities. The information sheets provided to participants included a paragraph designed to evoke an image or affective reaction to the firm (positive, negative, or neutral).

changes are abnormal and not persistent. Thus, as with the firm image information, these price changes were not relevant to future returns. Table 1 gives a summary of the six stocks.

Participants were informed that the return to investing in the market basket of stocks has historically been 10%. In previous years, the market's return has been determined using a discrete, uniform distribution (shown below).

Process Generating Returns					
Return	0.06	0.08	0.10	0.12	0.14
Probability	0.20	0.20	0.20	0.20	0.20

Participants were informed that the market return, in conjunction with firm-specific information (contained in the information sheets), was used to determine the return for each stock.⁹ They were also instructed that the price of each stock has generally moved with the market as reflected by the reported beta coefficient.

Participants were allotted fifteen minutes to review the information sheets and make their portfolio allocation decisions.¹⁰ They were instructed to assume a one-year investment horizon. That is, investment decisions would remain unchanged for a hypothetical one-year time period. After the participants made their decisions, we distributed a firm questionnaire. Participants were asked to rate each firm on a set of bipolar adjective scales, responding on a seven-point scale in each case. The scale endpoints (bipolar adjectives) included bad/good, boring/exciting, worthless/valuable, weak/strong, detestable/admirable, and weak relative prospects/strong relative prospects. Participant responses were used to assess their affective reactions to the firms. This technique (the semantic differential approach) is well known and commonly used in psychological research (e.g., Osgood, Suci, and Tannenbaum [1957]).

After all the participants had completed the firm questionnaire, the market's return was determined by drawing from a deck of five cards, where each card corresponded to one of the five equally likely returns for the market. Then the experimenter announced the year-end

price for each stock, computed using the capital asset pricing model. Subsequently, participants computed their portfolio values. The value multiplied by a conversion rate determined each participant's experimental earnings. After computing their earnings, participants completed a post-experimental demographic questionnaire. They were then paid and dismissed.

Results: Experiment 1

We investigate whether firm image affected individual portfolio allocation decisions. We compare the monies invested and the affective reactions for firms matched by industry membership. For each industry pair, we perform a Wilcoxon matched-pairs test of the null hypothesis of no difference across firm pairs within each industry.

The results are reported in Table 2. The third column of Panel A reports the mean investment in each firm; the third column of Panel B reports the mean affective reaction based on a scale of 1 (negative evaluation) to 7 (positive evaluation). In both cases, the standard deviation is reported in parentheses.

Each firm in the financial services industry had a neutral image, and participants' investment behavior suggests they were indifferent to the two firms. Participants did not invest more in one firm than the other (see Panel A, Table 2).

For the automotive and telecommunications industries, one firm in each industry had a positive image and the other had a negative image. Participants did invest more in the firm with the positive image in each industry. The final column of Panel A in Table 2 reports that Wilcoxon matched-pairs tests indicate significant differences in investment across firms with positive and negative images ($p < 0.01$).¹¹ In the automotive industry, mean dollar investment was significantly larger for Smithland Motors (positive image) than for MMC Motors (negative image). In the telecommunications industry, mean dollar investment was significantly larger for Metro Technologies (positive image) than for Power Resources (negative image).

Next we examine participant responses to the firm questionnaire in order to gain insight into their affect-

Table 2. *Experiment 1: Induced Image*

Panel A: Investment Choices			
Industry Membership	Firm Name	Mean (Std. Dev.) Investment	Wilcoxon Matched-Pairs Test
Financial Services	First National Bank	171,000 (143,671)	−0.624 (0.533)
	WC Financial	146,048 (118,032)	
Automotive	Smithland Motors	179,310 (98,026)	−3.444 (0.001)
	MMC Motors	60,648 (76,523)	
Telecommunications	Metro Technologies	175,360 (123,134)	−2.714 (0.007)
	Power Resources	78,789 (91,795)	
Panel B: Evaluations			
Industry Membership	Firm Name	Mean (Std. Dev.) Affective Reaction	Wilcoxon Matched-Pairs Test
Financial Services	First National Bank	4.486 (1.181)	−0.759 (0.448)
	WC Financial	4.306 (1.079)	
Automotive	Smithland Motors	5.097 (1.318)	−3.880 (0.000)
	MMC Motors	3.535 (1.186)	
Telecommunications	Metro Technologies	4.965 (1.239)	−3.487 (0.000)
	Power Resources	3.472 (1.216)	

Note: In this experiment, participants were asked to make portfolio allocation decisions after receiving information designed to evoke a neutral, positive, or negative affective reaction. The image induced by the information is designed to be neutral for First National Bank and WC Financial, positive for Smithland Motors and Metro Technologies, and negative for MMC Motors and Power Resources. The third column of Panel A reports the mean investment in each firm, and the third column of Panel B reports the mean affective reaction based on a scale of 1 (negative evaluation) to 7 (positive evaluation). In both cases, the standard deviation is reported in parentheses. The final columns of Panels A and B report the results of a Wilcoxon matched-pairs test of the null hypothesis of no difference across firm pairs within each industry. The cell entries are z-statistics, with two-tailed p-values in parentheses.

tive reactions to the firms. Participants rated each firm on a set of bipolar adjective scales. For each firm, we computed the average response to the six scales, which are reported in the third column of Panel B in Table 2. Wilcoxon matched-pairs tests indicate that across all six scales, the ratings are higher (i.e., more positive) for the firm with the positive image than for the firm with the negative image ($p < 0.01$).

Overall, firms with a positive image evoked more positive affective reactions and attracted greater investment than those with a negative image. We found no significant difference between the affective reactions for the financial services industry, which consisted of two firms with neutral images. Our findings suggest that value-irrelevant information reflected in firm image does affect individual investment behavior.

Experiment 2

We conducted a second experiment to provide further evidence of participant affective reactions. In Experiment 2, participants were again asked to make portfolio allocation decisions, but were not given information designed to evoke any affective reactions. The information sheet for each investment opportunity included only a one-paragraph narrative. The purpose here is to examine whether investment decisions vary across firms in the absence of information of an affective

nature. Thus, this experiment provides a control or basis from which we can establish whether the positive and negative information truly evoked an affective reaction.

We recruited thirty students from the same medium-sized university to participate in Experiment 2. As in Experiment 1, the students included undergraduates and graduates (masters), with the vast majority in at least their third year. Participants had a mean age of 23.6 years, and completed or were currently enrolled in an average of 2.4 finance courses. Twenty participants (or 67%) previously traded securities or took part in the management of an investment portfolio.

We conducted two experimental sessions, with fourteen and sixteen students per session. The procedures were identical to those of Experiment 1, except that the information sheets for each firm contained only one paragraph on historical data. The market's expectation is consistent with the historical data, determined using the same discrete, uniform distribution shown previously.

Results

As before, we examined investment behavior across industry pairs. The results of Wilcoxon matched-pairs tests, shown in Panel A of Table 3, indicate that investment behavior did not differ across firms in the financial services and automotive industries. For the telecommunications industry, however, participants

Table 3. *Experiment 2: No Induced Image*

Panel A: Investment Choices			
Industry Membership	Firm Name	Mean (Std. Dev.) Investment	Wilcoxon Matched-Pairs Test
Financial Services	First National Bank	123,010 (103,092)	−0.453 (0.651)
	WC Financial	131,343 (107,925)	
Automotive	Smithland Motors	156,807 (121,574)	−1.172 (0.241)
	MMC Motors	118,752 (108,420)	
Telecommunications	Metro Technologies	262,731 (173,144)	−2.092 (0.036)
	Power Resources	179,024 (201,590)	
Panel B: Evaluations			
Industry Membership	Firm Name	Mean (Std. Dev.) Affective Reaction	Wilcoxon Matched-Pairs Test
Financial Services	First National Bank	4.350 (0.886)	−0.544 (0.587)
	WC Financial	4.272 (0.865)	
Automotive	Smithland Motors	4.733 (0.968)	−1.175 (0.240)
	MMC Motors	4.639 (0.965)	
Telecommunications	Metro Technologies	5.194 (0.753)	−2.961 (0.003)
	Power Resources	4.594 (1.051)	

Notes: In this experiment, participants were asked to make portfolio allocation decisions but were not given information designed to evoke an affective reaction. The third column of Panel A reports the mean investment in each firm, and the third column of Panel B reports the mean affective reaction based on a scale of 1 (negative evaluation) to 7 (positive evaluation). In both cases, the standard deviation is reported in parentheses. The final columns of Panels A and B report the results of a Wilcoxon matched-pairs test of the null hypothesis of no difference across firm pairs within each industry. The cell entries are z-statistics, with two-tailed p-values in parentheses.

invested more in Metro Technologies than in Power Resources. The primary difference between the two firms is that Metro Technologies previously experienced an abnormally large price increase, while Power Resources experienced an abnormally large price decrease. The results suggest that a firm's experience, even when it is *abnormal*, has a persistent effect on investment behavior. Our finding is consistent with other experimental findings that investors over-rely on previous earnings in making investment decisions (e.g., Bloomfield, Libby, and Nelson [2003]).

Next we examine participants' responses to the firm questionnaire. The third column of Panel B in Table 3 reports the average affective reaction on a scale of 1 (negative evaluation) to 7 (positive evaluation). For the financial services and automotive industries, the average ratings do not differ between firm pairs at conventional levels. In contrast, for the telecommunications industry, the average rating for Metro Technologies is higher than that for Power Resources at $p < 0.01$. This shows that historical abnormal experience, in addition to the textual information used in Experiment 1, does influence individual investment behavior.

Experiment 3

Experiment 3 examines whether individual investment choices are affected by beliefs about others' investment behavior. The ending price for each stock is partially determined by the level of demand for the

stock. Thus, prices are endogenously determined. This design allows us to assess the extent to which participants believe affective reactions are shared across investors. As in Keynes's [1964] beauty contest, investors choose the stocks they believe others will find the most attractive.¹²

Avery and Chevalier [1999] suggest that sentiment can result in individuals relying on value-irrelevant information (the advice of false experts) in football betting. Information designed to evoke an affective reaction is likely to provide a focal point or common basis of assessment across individuals (see, e.g., Schelling [1960]). Individual and market outcomes can be influenced by information that provides a readily available and common basis for assessment. In Experiment 3, we examine whether endogenous pricing exacerbates the effect of affect on individual investment behavior. In this experiment, participants attempt to predict the behavior of their cohort before making investment decisions.

We recruited thirty-four more students from the same university. As in earlier experiments, the students included undergraduates and graduates (masters), with the vast majority in at least their third year. Participants had a mean age of 24.5 years, and completed or were currently enrolled in an average of 3.1 finance courses. Twenty participants (59%) previously traded securities or took part in the management of an investment portfolio.

We conducted two experimental sessions, with sixteen and eighteen students per session. The procedures differed from those of Experiments 1 and 2 in that we

varied how the ending stock prices were determined.¹³ Participants were told that the price of each stock is determined by two components: 1) the demand for the stock (i.e., the proportion of total funds invested in the stock by those participating in the experimental session), and 2) a returns distribution used in conjunction with firm-specific information to generate a price distribution. Participants were instructed that stock prices are determined predominantly by the demand for each stock.¹⁴ Higher demand leads to higher stock prices in each particular experimental session. The second component uses the same returns distribution as described earlier for the market's expectation.

Results

As before, we examine investment behavior across industry pairs. Wilcoxon matched-pairs tests, shown in Panel A of Table 4, indicate that investment behavior does not differ across firms in the financial services industry. For the automotive and telecommunications industries, on the other hand, participants invested more in the firm with a positive image.

We also examine participants' responses to the firm questionnaire. The third column of Panel B in Table 4 reports the mean affective reaction on a scale of 1 (negative evaluation) to 7 (positive evaluation). For the financial services industry, the average ratings did not

differ between firm pairs at conventional levels. For the automotive and telecommunications industries, however, the average rating was higher for the firms with a positive image (Smithland Motors and Metro Technologies) than for firms with a negative image (MMC Motors and Power Resources), at $p < 0.01$. These results are consistent with those reported earlier, and establish that investment behavior is influenced by affective reactions.

To determine whether endogenous pricing exacerbates the effect of affect on individual investment decisions, we compared investment allocations in Experiment 3 with those in Experiment 1. The results of Mann-Whitney tests indicate that the difference in investment between the positive (Smithland Motors) and negative (MMC Motors) image firms within the automotive industry is larger in Experiment 3 than in Experiment 1, but the increase is not statistically significant. For the telecommunications industry, we found that the difference was significantly larger in Experiment 3 than in Experiment 1, at $p < 0.01$.

If prices are endogenously determined, it is in investors' best interests to allocate their endowments to the same stock. Recall that prices increase with increases in demand. Clearly our participants understood this goal, as 45% of monies allocated to stock in Experiment 3 went to one stock, Metro Technologies. The intriguing aspect of this result is that participants focused

Table 4. *Experiment 3: Induced Image with Endogenous Prices*

Panel A: Investment Choices			
Industry Membership	Firm Name	Mean (Std. Dev.) Investment	Wilcoxon Matched-Pairs Test
Financial Services	First National Bank	95,245 (109,538)	−0.166 (0.868)
	WC Financial	100,637 (122,221)	
Automotives	Smithland Motors	220,343 (154,372)	−4.263 (0.000)
	MMC Motors	25,147 (49,627)	
Telecommunications	Metro Technologies	450,686 (318,659)	−3.866 (0.000)
	Power Resources	93,235 (189,444)	
Panel B: Evaluations			
Industry Membership	Firm Name	Mean (Std. Dev.) Affective Reaction	Wilcoxon Matched-Pairs Test
Financial Services	First National Bank	4.162 (0.842)	−0.022 (0.983)
	WC Financial	4.172 (0.875)	
Automotives	Smithland Motors	4.976 (1.057)	−4.128 (0.000)
	MMC Motors	3.368 (0.920)	
Telecommunications	Metro Technologies	5.529 (1.109)	−4.183 (0.000)
	Power Resources	3.794 (1.185)	

Note: In this experiment, final stock prices were affected by the ex post observed demand for the stock of each firm. Participants were asked to make portfolio allocation decisions after receiving information designed to evoke a neutral, positive, or negative affective reaction. The image induced by the information is designed to be neutral for First National Bank and WC Financial, positive for Smithland Motors and Metro Technologies, and negative for MMC Motors and Power Resources. The third column of Panel A reports the mean investment in each firm, and the third column of Panel B reports the mean affective reaction based on a scale of 1 (negative evaluation) to 7 (positive evaluation). In both cases, the standard deviation is reported in parentheses. The final columns of Panels A and B report the results of a Wilcoxon matched-pairs test of the null hypothesis of no difference across firm pairs within each industry. The cell entries are z-statistics, with two-tailed p-values in parentheses.

on the stock with a positive image *and* a positive abnormal historical price change. The second largest allocation (22%) went to Smithland Motors, a stock with a positive image and no abnormal price history.

Concluding Remarks

This paper examined individual investment choices. Our results indicate that affective reactions have an important influence on behavior. The finding is noteworthy because the information used to induce affective assessments was not value-relevant. That is, participants in our experiments formed a positive or negative image of a company based on information that was not indicative of future prospects. They then invested more heavily in the companies that evoked a positive image, and less heavily in those that evoked a negative image.

We found that the results were exacerbated when individuals explicitly considered the behavior of others (i.e., when identifying stocks that others believe are attractive investment opportunities). Empirically, individuals may flock to invest in the same "hot stocks" that are front-and-center in terms of publicity and positive exposure. Overall, our findings highlight the importance of promoting a positive firm image, be it through advertising campaigns, upbeat media coverage, or active investor relations departments.

On the surface, our findings may appear inconsistent with optimal decision-making. However, this conclusion is not warranted; individual utility functions include arguments based on aspects other than financial measures (Moreno, Kida, and Smith [2002]). People consider their affective reaction in utility measurement, and there are emotional costs and benefits that cannot be ignored. While progress has been made in incorporating emotions into economic models of choice, a complete understanding of the role of affect in investment behavior remains a challenge for future research.

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Notes

1. An important feature of our experimental setting is that the participants' investment decisions have real consequences. Partic-

- ipant compensation is based on actual investment choices, so they have economic incentives to make optimal decisions.
2. Barber and Odean [2003] do not examine attention-grabbing information (or events), but instead use abnormal trading volume as a proxy. They argue that abnormally high trading volume is an indicator that investors are paying attention to a stock.
3. Barber, Heath, and Odean [2003] proxy for attention-grabbing stocks using various measures, including sales growth, return growth, and inclusion in *Fortune* magazine's list of most-admired companies.
4. Psychologists debate whether the structure of affective experiences is bipolar. For example, Russell [1979] argues that positivity and negativity are reciprocally activated and thus bipolar (i.e., an increase in positivity results in a decrease in negativity). By comparison, Diener and Emmons [1985] contend that positivity and negativity are independent factors. Though structure is debatable, positivity and negativity generally have antagonistic effects on response predispositions (Ito and Cacioppo [2001]). Thus, affective reactions can be characterized as bipolar, regardless of the underlying affective structure.
5. Bruner, Goodnow, and Austin [1956] suggested in passing, nearly fifty years ago, that affect provides a basis for concept formation and categorization.
6. The results of Moreno, Kida, and Smith [2002] are inconsistent with the predictions of Kahneman and Tversky's [1979] prospect theory, an influential theory of decision-making under uncertainty. In contrast to the predictions of prospect theory, Moreno, Kida, and Smith [2002] report that in the presence of affect participants are risk-taking in gain contexts and risk-avoiding in loss contexts.
7. Only one participant allocated the entire endowment to cash. These monies, using a known conversion rate, are the participants' to keep.
8. Beta was defined in the experimental instructions as the measure of market risk from the capital asset pricing model. It reflects the correlation between the return on the stock and the return on the market.
9. In addition to the experimental sessions reported here, we recruited sixty-five students to participate in additional sessions designed to examine the impact of affect in falling (bearish) and rising (bullish) markets. Participants were instructed that, for the current year, the market's expectation has changed. In the bullish market condition, participants were instructed that "the recent strong performance of international equity markets has led to great optimism among analysts who are now predicting additional upward movements in prices." In turn, the process generating returns shifted up 8% so that the expected return is 18%, with a range of 14% to 22%. In the bearish market condition, participants were instructed that "the recent collapse of international markets has led to great pessimism among analysts, who are now predicting additional downward revaluation in the equity markets." In this case, the process generating returns shifts down 8% so that the expected return is 2%, with a range of -2% to 6%. Analysis indicates that investment behavior in falling or rising market conditions is very similar to that reported for our first experiment, in which the market returns generating process is stationary.
10. Pre-tests indicate that fifteen minutes is sufficient to allow participants to review the information sheets and make their investment decisions.
11. Results are similar when we control for investment in cash. When we compare the percentage of investment allocated to each firm relative to total stock investment (i.e., the endowment less monies held in cash), participants again invested more in the firm with a positive image within each industry pair.

12. Other research has examined behavior in beauty contests. In these games, the winner is the person who chooses a number closest to a function of the mean of all numbers chosen. Nagel [1995] and Bosch-Domenech et al. [2002] analyze experimental subjects' reasoning processes in abstract laboratory and real newspaper beauty contests, and conclude that the level of reasoning varies across participants.
13. Because prices are based on investment level, we also removed information on average daily trading volume.
14. In additional sessions, prices were less sensitive to demand, but still positively related. The results are similar to those for Experiment 3, and are not reported in detail.

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APPENDIX
Information Available on Investment Opportunities

First National Bank of SmithLand

Business and Financial Summary: First National Bank of SmithLand is a highly diversified financial services institution and is the country's first chartered bank. The bank operates in more than thirty lines of business through several groups.

In general, net income has been relatively flat, with a small increase over the past four years. Over the most current year, net income rose 2%.

Price History:

Current Price (time t)	Average Daily Trading Volume	Year-End Prices			
		t – 1	t – 2	t – 3	t – 4
\$120.00	34,500	\$114.57	\$107.76	\$98.43	\$91.22

Other Information for the Current Year:

Revenues	\$9.58 billion
Assets	\$62.42 billion
Price-to-Earnings Ratio	15.25
Beta	0.79

WC Financial

Business and Financial Summary: WC Financial Corp. is a diversified financial services company. The Company is engaged in a general commercial banking and investment management business, and provides a variety of financial services.

Over the most current year, interest income rose 3% and net income was almost unchanged from the previous year. Results reflect profitable acquisitions and losses on lease contracts.

Price History:

Current Price (time t)	Average Daily Trading Volume	Year-End Prices			
		t – 1	t – 2	t – 3	t – 4
\$110.28	20,400	\$105.71	\$99.96	\$92.01	\$85.83

Other Information for the Current Year:

Revenues	\$4.05 billion
Assets	\$10.98 billion
Price-to-Earnings Ratio	14.75
Beta	0.72

SmithLand Motor Company

Business and Financial Summary: SmithLand Motor Company designs, manufactures, and markets automobiles and automobile parts. The Company has devoted significant efforts to improving service and quality and has experienced growth in sales. In response to consumer demand, the Company is currently targeting innovation in its mid-sized luxury cars and fuel-efficient, economy cars.

For the last four years, SmithLand Motor Company has been lead by R. Wentworth, a widely revered industry innovator. He is well-liked and respected by his employees and lauded in the community. The charismatic leader devotes significant amounts of his time and resources to philanthropic activities, even though colleagues report that he spends sixty to eighty hours per week in the office. He typically spearheads local and regional fundraising campaigns for medical research, and donates substantial funds for educational purposes.

Price History:

Current Price (time t)	Average Daily Trading Volume	Year-End Prices			
		t – 1	t – 2	t – 3	t – 4
\$102.81	80,900	\$96.77	\$88.94	\$79.08	\$71.63

Other Information for the Current Year:

Revenues	\$12.86 billion
Assets	\$98.37 billion
Price-to-Earnings Ratio	17.67
Beta	1.04

MMC Motors, Inc.

Business and Financial Summary: MMC Motors produces and sells automobiles. The Company also engages in other businesses, including financing and leasing of vehicles and equipment.

Several years ago, the Company faced significant challenges with its labor force. Workers at its largest assembly plant went on strike for two months, significantly affecting the firm's production level. Their demands centered around compensation, working conditions, and medical and other benefits. Labor leaders argued that MMC's employees were among the lowest paid in the industry, and safety standards were not always adhered to. Eventually, the company and its workers agreed to arbitration. Since that time, the Company has maintained a tense relationship with its employees.

Price History:

Current Price (time t)	Average Daily Trading Volume	Year-End Prices			
		t – 1	t – 2	t – 3	t – 4
\$110.37	102,000	\$103.54	\$95.16	\$84.07	\$75.74

Other Information for the Current Year:

Revenues	\$19.28 billion
Assets	\$120.94 billion
Price-to-Earnings Ratio	18.43
Beta	1.10

Metro Technologies

Business and Financial Summary: Metro Technologies is a provider of local, regional, and national paging and other wireless messaging services. The Company has experienced recent growth as a result of acquisitions and newly constructed facilities. In turn, revenues have grown.

Two years ago, Metro received various industry awards for excellence and commitment to quality management. The ensuing media attention, coupled with a creative advertising program, produced significant growth in the number of subscribers. As a result, the Company's stock price soared 25%.

Price History:

Current Price (time t)	Average Daily Trading Volume	Year-End Prices			
		t – 1	t – 2	t – 3	t – 4
\$72.42	41,000	\$67.52	\$54.01	\$47.17	\$42.08

Other Information for the Current Year:

Revenues	\$28.25 billion
Assets	\$78.56 billion
Price-to-Earnings Ratio	22.20
Beta	1.21

Power Resources, Inc.

Business and Financial Summary: Power Resources, Inc. provides digital wireless personal communications services in the Land of Smith. The company's offerings consist of a full range of telecommunications services.

Three years ago, the Company was subject to the scrutiny of the National Securities Board (NSB), the federal body that regulates securities markets in the Land of Smith. An investigation by the NSB revealed that the Company's financial statements contained various accounting improprieties, which affected assets and revenues. As a result of the investigation, the Company was fined and required to restate its financial statements. In turn, the Company's common stock valuations fell 20%. Since that time, the company has not had any further problems with the NSB.

Price History:

Current Price (time t)	Average Daily Trading Volume	Year-End Prices			
		t – 1	t – 2	t – 3	t – 4
\$84.12	59,200	\$78.73	\$72.15	\$90.19	\$80.96

Other Information for the Current Year:

Revenues	\$4.23 billion
Assets	\$20.14 billion
Price-to-Earnings Ratio	22.45
Beta	1.14

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