FAJ Financial Analysts Journal
Volume 64 • Number 2

PERSPECTIVES

Affect in a Behavioral Asset-Pricing Model

Meir Statman, Kenneth L. Fisher, and Deniz Anginer

We often admire a stock or disapprove of it when we hear its name even before we think about its P/E or the growth of its company's sales. Think of Google Inc., General Electric Company, Enron Corporation. Like houses, cars, watches, and many other products, stocks exude "affect." Affect is the specific quality of "goodness" or "badness," and Slovic, Finucane, Peters, and MacGregor (2002) described it as a feeling that occurs rapidly and automatically, often without consciousness. Zajonc (1980), an early proponent of the importance of affect in decision making, wrote, "We do not just see house: We see a handsome house, an ugly house, or a pretentious house" (p. 154) and added:

> We sometimes delude ourselves that we proceed in a rational manner and weigh all the pros and cons of the various alternatives. But this is rarely the case. Quite often "I decided in favor of X" is no more than "I liked X." We buy the cars we "like," choose the jobs and houses we find "attractive," and then justify these choices by various reasons. (p. 155)

Kahneman (2002) described the affect heuristic in his Nobel Prize lecture as "probably the most important development in the study of judgment heuristics in the last decades."

Affect, embedded in location, brand, and connotation, plays a role in the pricing models for houses, cars, and watches. But according to standard financial theory, affect plays no role in the pricing of financial assets. In the capital asset pricing model (CAPM) and the three-factor model (Fama and French 1992), expected returns are determined by risk alone. Beta measures risk in the CAPM, and according to Fama and French, market capitalization and book-to-market ratio measure risk in the three-factor model. But affect plays a role in behavioral asset-pricing models, where it is referred to as "sentiment" or an "expressive set of characteristics."

Statman (1999) described a behavioral asset-pricing model that includes utilitarian factors, such as risk, but also expressive or affect characteristics, such as the negative affect of tobacco and other "sin" companies or the positive affect of prestigious hedge funds. He illustrated the model with an analogy to the watch market. A $10,000 Rolex watch and a $50 Timex watch have approximately the same utilitarian qualities; both watches display the same time. But Rolex buyers are willing to pay an extra $9,950 over the price of the Timex because the affect of a Rolex—consisting of prestige and, perhaps, beauty—is more positive than that of a Timex.

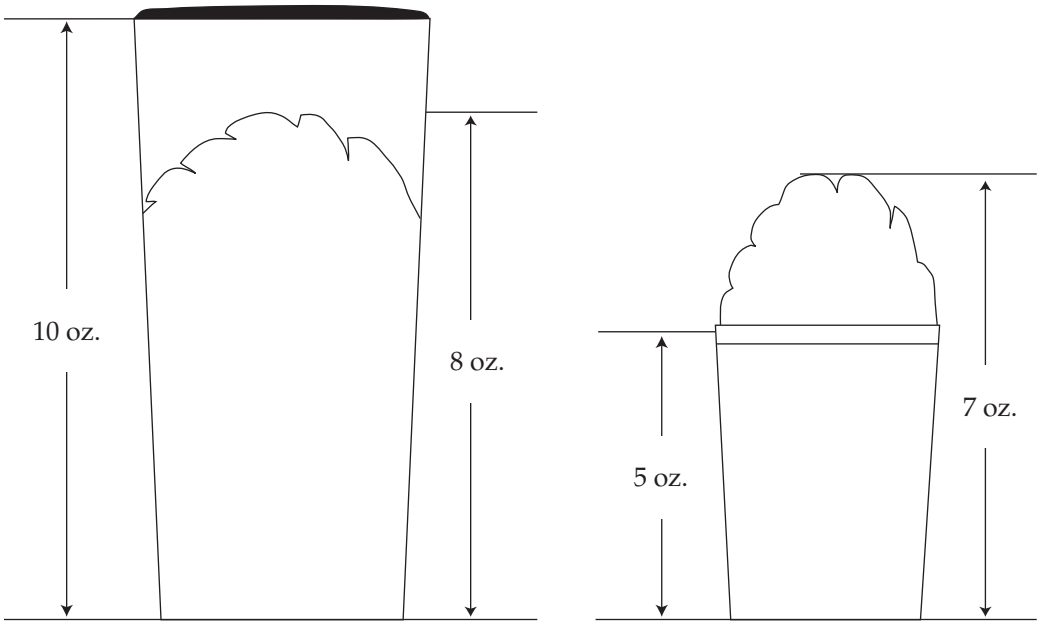
This article is about asset-pricing models, not market efficiency, although the two are interrelated. We found that the returns of stocks admired by respondents to the *Fortune* surveys are lower than the returns of stocks of less admired companies, but we do not claim to have uncovered a new anomaly. Rather, we hypothesize that affect plays a role in pricing models of financial assets. In particular, we hypothesize that affect underlies the market-capitalization and book-to-market factors of three-factor models. We present evidence consistent with this hypothesis and discuss the role of affect in a behavioral asset-pricing model.

Affect in Pricing Models

Considerable evidence suggests that affect plays a role in pricing. For example, Hsee (1998) presented to subjects pictures of two ice-cream cups, depicted in **Figure 1**. The cup on the left contains 8 ounces of ice cream, but its affect is negative because the serving seems stingy in its 10-oz. cup. In contrast, the affect of the 7 oz. of ice cream on the right is positive because it is overflowing its 5-oz. cup. Hsee found that subjects who saw only the 5-oz. cup overflowing with the 7 oz. of ice cream were willing to pay more for it than subjects who saw only the 10-oz. cup stingily filled with 8 oz. of ice cream. But subjects who saw the two cups side by side were willing to pay a higher price for the cup with 8 oz. of ice cream.

Meir Statman is Glenn Klimek Professor of Finance at Santa Clara University, California. Kenneth L. Fisher is founder, chairman, and CEO of Fisher Investments, Inc. Deniz Anginer is a doctoral student at the University of Michigan, Ann Arbor.

Figure 1. Affect in the Pricing of Ice Cream



Source: Hsee (1998).

Affect is an emotion that, like all emotions, is grounded in evolutionary psychology. Cosmides and Tooby (2000) wrote that evolutionary psychology is a theoretical framework that combines principles and results from evolutionary biology, cognitive science, anthropology, and neuroscience to describe human behavior, and they described emotions as programs whose function is to direct the activities and interactions of subprograms, including those of perception, attention, goal choice, and physiological reactions. Cosmides and Tooby illustrated the idea with the emotion of fear, such as when stalked by predators:

> Goals and motivational weightings change; safety becomes a far higher priority. . . . You are no longer hungry; you cease to think about how to charm a potential mate. . . . adrenalin spikes. . . . (pp. 93–94)

Emotions prevent us from being lost in thought when it is time to act. But sometimes, emotions subvert good thinking. Reliance on emotions increases with the complexity of information and with stress. Shiv and Fedorikhin (1999) described an experiment in which subjects chose between a piece of chocolate cake, which had intense positive affect but was inferior from a cognitive perspective, and a serving of fruit salad, with its less positive affect but superiority from a cognitive perspective. Subjects were brought to a room, one at a time. Some were assigned a low-stress task—memorizing a two-digit number. Others were assigned a higher-stress task—memorizing a seven-digit number. Next, each subject was asked to go to another room. On their way, each could choose chocolate cake or fruit salad. Shiv and Fedorikhin found that subjects who were under the greater stress of memorizing the seven-digit number were more likely to be guided by affect and choose the chocolate cake over the fruit salad.

Stocks are notoriously complex, and evaluating them is stressful. Are shares of Google at $700 per share better investments than shares of General Motors Corporation at $20 per share? Faced with such tasks, investors may try to overcome the pull of affect through a systematic examination of relevant information, but affect still exerts its power. Companies with internet-related dot-com names had positive affect in the boom years of the late 1990s, and Cooper, Dimitrov, and Rau (2001) found that companies that changed their names to dot-com names had positive abnormal returns on the order of 74 percent in the 10 days surrounding the day on which the change was announced—even when nothing about the business had changed. Companies with dot-com names acquired negative affect in the bust years of the early 2000s, and Cooper, Khorana, Osobov, Patel, and Rau (2005) found that companies that changed from a dot-com name to a conventional name during that time experienced positive abnormal returns.

These findings illustrate "integral affect"—affect that is associated with the characteristics of a particular object, such as a stock. "Incidental affect" arises not from an object but from an unrelated event. For example, Welch (1999) induced fear in subjects by showing them two minutes of Stanley Kubrick's movie *The Shining*. He found that the induced fear carried over beyond the movie, increasing subjects' risk aversion in choices unrelated to the movie. In the context of stocks, Hirshleifer and Shumway (2003) found that the positive incidental affect of sunny days brought high stock returns and Edmans, Garcia, and Norli (2007) found that the negative incidental affect of soccer losses brought low stock returns.

The immediate effect of an increase in affect is an increase in stock prices, but higher stock prices set the stage for lower future returns. This is illustrated in the returns of stocks shunned by "socially responsible" investors. These investors regularly exclude from their portfolios stocks of companies engaged in selling tobacco, alcohol, military products, or firearms, in the gaming industry, or in nuclear operations. Hong and Kacperczyk (2007) found that stocks associated with tobacco, alcohol, and gaming operations had high returns relative to the stocks of other companies. Similarly, Statman and Glushkov (2008) found that stocks of companies associated with tobacco, alcohol, gaming, firearms, military sales, and nuclear operations had high returns relative to stocks of other companies. In this study, we hypothesized, analogously, that the negative affect of companies ranked low in *Fortune*'s survey of Most Admired companies is accompanied by higher stock returns.

Market Efficiency and Asset-Pricing Models

Fama (1970) noted that market efficiency per se is not testable. Market efficiency must be tested jointly with an asset-pricing model, such as the CAPM or the Fama–French three-factor model. For example, the excess returns relative to the CAPM of small-cap stocks and stocks with high ratios of book value of equity to market value of equity (BV/MV) might indicate that the market is not efficient or that the CAPM is a bad model of expected returns. But when it comes to tests of market efficiency, the CAPM is quite different from the three-factor model.

The CAPM presents expected returns as a function of *objective* risk. The objective measure of investment risk is based on the probability distribution of investment outcomes, usually equated with the variance of a portfolio and the beta of a security within a portfolio. In contrast, the three-factor model presents expected returns as a function of beta (a measure of objective risk) but also as a function of market capitalization and BV/MV. What do market capitalization and BV/MV represent? Fama and French argued that they represent objective risk, but much of the evidence is inconsistent with their argument. For example, Lakonishok, Shleifer, and Vishny (1994) found that value stocks (defined as having high BV/MV) outperformed growth stocks (those with low BV/MV) in three out of four recessions from 1963 through 1990, which is not consistent with the view that value stocks are riskier. Similarly, Skinner and Sloan (2002) found that the relatively high returns of value stocks are not a result of their higher risk. Rather, value stocks' returns are a result of large declines in the prices of growth stocks in response to negative earnings surprises. For the study of the relationship between affect and stock returns, we first turned to *Fortune* magazine.

Performance of *Fortune* Admired and Spurned

Fortune has been publishing the results of an annual survey of company reputations since 1983. The survey that was published in March 2007 included 587 U.S. companies. *Fortune* asked more than 10,000 senior executives, directors, and security analysts who responded to the survey to rate, using a scale of 0 (poor) to 10 (excellent), the 10 largest companies in their industries based on eight attributes of reputation. We focused on the attribute of long-term investment value (LTIV) because it reflects perceptions of respondents about company stocks that incorporate the respondents' expectations for the companies' returns and risk.

Consider two portfolios constructed by *Fortune* scores, each consisting of an equally weighted half of the *Fortune* stocks. The Admired portfolio contains the stocks of companies with the highest LTIV scores, and the Spurned portfolio contains the stocks with the lowest scores. If *Fortune* respondents believe that the stock market is efficient, they should rate all stocks equally on LTIV because in an efficient market, there are no stocks with high LTIV and no stocks with low LTIV. If *Fortune* respondents believe that the stock market is inefficient and that they can identify correctly the stocks with higher LTIV, they should expect the stocks of companies with high LTIV to do better than the stocks of companies with low LTIV. But *Fortune* respondents rated some stocks high on LTIV and other stocks low because the respondents were influenced by the positive affect of the first group and the negative affect of the other.

To investigate whether *Fortune* respondents' ratings correspond to either an efficient or an inefficient market model, we constructed Admired and Spurned portfolios and followed their fortunes. The portfolios were constructed as of 30 September 1982 on the basis of the *Fortune* survey published subsequently in 1983 (because *Fortune* surveys are completed by respondents around 30 September of the year before they are published).

Fortune does not define how long "long term" is. We investigated horizons of two, three, and four years. For the two-year horizon, we reconstituted each portfolio on 30 September every two years, so the first reconstitution was based on the survey conducted in 1984 and published in 1985. We constructed portfolios similarly for the three- and four-year horizons. Fortunately, the overall 24-year period, 30 September 1982 to 30 September 2006, is divisible by 2, 3, and 4, so each time period was included in each analysis.

Admired and Spurned portfolios were based on companies' industry-adjusted scores. We calculated the mean score of companies in each industry in the surveys published in 1983–2007 and defined the industry-adjusted score of a company as the difference between its score in a given survey and the mean score of companies in its industry. The mean scores of companies in some industries were found to be higher, on average, than those of companies in other industries; for example, the mean score for companies in the communications industry was 6.43 versus a score of 5.14 for the coal mining industry.

Table 1 provides the returns to the portfolios as reconstituted every two, three, or four years and measured in a CAPM analysis. The returns of the Spurned portfolios exceed those of the Admired portfolios. For example, when the portfolios were rebalanced every four years, the mean annualized return of the Spurned portfolio is 19.7 percent—higher than the mean annualized return of the Admired portfolio by 4.6 percentage points.

The advantage of the Spurned portfolios over the Admired portfolios remained intact when we assessed them by using the CAPM. The alphas of the Spurned portfolios as measured in the CAPM are consistently higher than those of the Admired

Table 1. CAPM-Based Performance of Admired and Spurned Portfolios, 30 September 1982 to 30 September 2006
(*t*-statistics in parentheses)

Measure	Spurned	Admired	Difference (percentage points)
Portfolios reconstituted every two years			
Mean annualized return	18.99%	15.65%	3.34
Annualized alpha	4.37%	1.94%	2.43
	(2.43)**	(1.67)*	
Beta	1.04	0.98	0.06
	(30.84)***	(44.82)***	
Adjusted R^2	0.76	0.87	
Portfolios reconstituted every three years			
Mean annualized return	17.83%	16.02%	1.81
Annualized alpha	3.81%	2.29%	1.52
	(2.17)**	(1.95)*	
Beta	1.03	1.00	0.04
	(31.24)***	(44.58)***	
Adjusted R^2	0.77	0.87	
Portfolios reconstituted every four years			
Mean annualized return	19.72%	15.12%	4.60
Annualized alpha	4.89%	1.57%	3.32
	(2.82)***	(1.31)	
Beta	1.03	0.98	0.05
	(31.66)***	(42.96)***	
Adjusted R^2	0.77	0.86	

Notes: Portfolios are equally weighted. Analysis is of monthly data.

*Statistically significant at the 10 percent level.
**Statistically significant at the 5 percent level.
***Statistically significant at the 1 percent level.

portfolios. For example, the annualized alpha of the Spurned portfolio when portfolios were reconstituted every four years is 4.89 percent whereas it is only 1.57 percent for the Admired portfolio. The alphas of the Spurned portfolios are positive and statistically significant for all reconstitution intervals. The alphas of the Admired portfolios are always positive but are statistically significant only for the three-year reconstitution interval.[1]

A four-factor analysis (consisting of the original three Fama–French factors plus a momentum factor) of the portfolios is presented in **Table 2**. It shows that companies in the Spurned portfolios had higher objective risk than companies in the

Table 2. Four-Factor-Based Performance of Admired and Spurned Portfolios, 30 September 1982 to 30 September 2006
(*t*-statistics in parentheses)

Measure	Spurned	Admired	Difference (percentage points)
Portfolios reconstituted every two years			
Annualized alpha	1.90%	0.35%	1.55
	(1.55)	(0.36)	
Beta	1.18	1.09	0.09
	(45.75)***	(53.61)***	
Small minus big	0.36	–0.05	0.41
	(11.25)***	(–1.99)***	
Value minus growth	0.59	0.29	0.29
	(15.26)***	(9.66)***	
Momentum	–0.24	–0.09	–0.15
	(–10.60)***	(–4.95)***	
Adjusted R^2	0.90	0.92	
Portfolios reconstituted every three years			
Annualized alpha	1.29%	0.81%	0.48
	(1.04)	(0.83)	
Beta	1.17	1.10	0.06
	(44.60)***	(54.08)***	
Small minus big	0.35	–0.04	0.39
	(10.81)***	(–1.46)	
Value minus growth	0.57	0.30	0.26
	(14.54)***	(9.95)***	
Momentum	–0.22	–0.11	–0.11
	(–9.53)***	(–5.94)***	
Adjusted R^2	0.89	0.92	
Portfolios reconstituted every four years			
Annualized alpha	2.07%	–0.02%	2.09
	(1.64)	(–0.03)	
Beta	1.17	1.09	0.08
	(44.18)***	(52.01)***	
Small minus big	0.32	–0.02	0.34
	(9.70)***	(–0.96)	
Value minus growth	0.57	0.32	0.25
	(14.42)***	(10.11)***	
Momentum	–0.19	–0.11	–0.09
	(–8.25)***	(–5.72)***	
Adjusted R^2	0.89	0.92	

Notes: Portfolios are equally weighted. Analysis is of monthly data. Momentum is the difference between the return of a portfolio containing stocks with high returns over the previous 2–12 months and a portfolio containing stocks with low returns over the same period.

*Statistically significant at the 10 percent level.
**Statistically significant at the 5 percent level.
***Statistically significant at the 1 percent level.

Admired portfolios. Betas in the Spurned portfolios are consistently higher than betas in the Admired portfolios. The four-factor analysis also shows that the characteristics of small cap, value, and poor past returns (low short-term momentum) are associated with the Spurned portfolios. The tilts of the Spurned portfolios toward small cap and value are consistently greater than those of the Admired portfolios, and the momentum returns of the Spurned portfolios are consistently lower than those of the Admired portfolios.

Additional characteristics of the portfolios are presented in **Table 3**. Companies in the Spurned portfolios during the period had higher ratios of earnings to price (E/P), higher ratios of cash flow to price (CF/P), lower past sales and earnings growth, and lower returns on assets (ROAs).

The question is what these results say about the asset-pricing models that we use.

Table 3. Characteristics of Stocks in Admired and Spurned Portfolios: Mean Values as of 30 September of Each Year, 1982–2005

Measure	Admired	Spurned
Return in previous year (%)	21.57	11.06
Return in previous three years (%)	81.24	38.47
Return in previous five years (%)	169.44	79.50
Market capitalization ($ millions)	19,327	5,853
BV/MV	0.491	0.751
E/P	0.066	0.079
CF/P	0.103	0.136
Sales growth	0.101	0.035
Earnings growth	0.127	0.052
ROA	0.158	0.125
Beta	0.980	1.040

Notes: "Previous year(s)" returns are the returns during the 12, 36, and 60 months prior to the end of September of the portfolio formation year. Market capitalization and price are as of the end of September of portfolio formation year. Book value of equity (defined as in Davis, Fama, and French 2000) is as of the end of the fiscal year prior to portfolio formation. Earnings for the fiscal year are prior to portfolio formation. Cash flow (earnings + depreciation) for the fiscal year is prior to portfolio formation. E/P and CF/P were set to zero if they were negative. Sales growth = log change in sales for the two fiscal years prior to the end of September of the portfolio formation year. Earnings growth = log change in earnings for the two fiscal years prior to the end of September of the portfolio formation year. ROA was calculated as the ratio of operating income before depreciation to total assets at the end of the fiscal year prior to portfolio formation. Betas are from 60 monthly returns (and minimum 36 months) prior to the end of portfolio formation year.

Affect in a Behavioral Asset-Pricing Model

In the behavioral asset-pricing model outlined here, expected returns are high when *objective* risk is high and also when *subjective* risk is high. High subjective risk comes with negative affect, and low subjective risk comes with positive affect. Subjective risk is not always the same as objective risk. For example, Ganzach (2000) presented a list of 30 international stock markets to two groups of subjects. One group was asked to judge the expected returns of the market portfolios of each stock market; the other group was asked to judge the risk of these market portfolios. A CAPM-like asset-pricing model based entirely on objective risk would lead us to expect a positive correlation between assessments of risk and assessments of expected returns, but Ganzach found a negative correlation: Markets with high expected returns were perceived to have low risk.

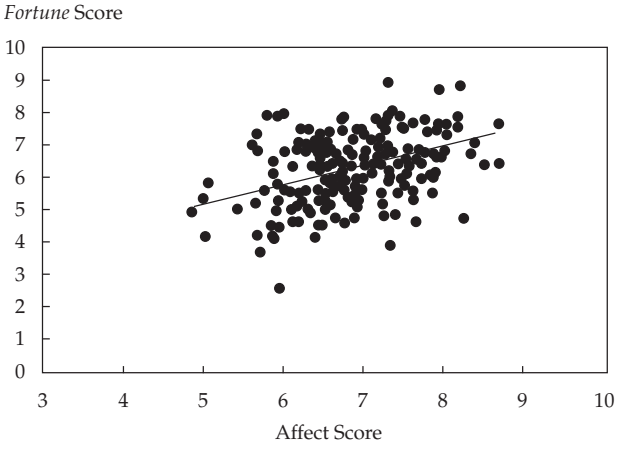
The negative relationship between subjective risk and expected returns in Ganzach's study is one example of a generally negative relationship between subjective risk and perceived benefits. Slovic et al. (2002) attributed that negative relationship to affect. When affect is positive, benefits are judged high and risk is judged low. And when affect is negative, benefits are judged low and risk is judged high. We found similar results in our experiments.

In the first experiment, conducted in May 2007, we presented investors who were high-net-worth clients of an investment firm with only the names and industries of the 210 companies from the *Fortune* 2007 survey.[2] We asked the investors to score the companies on a 10-point scale ranging from "bad" to "good." The questionnaire said, "Look at the name of the company and its industry and quickly rate the feeling associated with it on a scale ranging from bad to good. Don't spend time thinking about the rating. Just go with your quick, intuitive feeling." The affect score of a company is the mean score assigned to it by the surveyed investors. As **Figure 2** shows, we found a positive and statistically significant relationship between affect scores and *Fortune* scores.

In the second experiment, conducted in July 2007, we presented to another group of investors the names and industries of the same 210 companies from the *Fortune* 2007 survey. One group of investors was asked to rate the future return of each stock on a 10-point scale ranging from low to high. Another group of investors was asked to rate the risk of each stock on the same scale.[3] The risk and return scores of companies were the mean scores assigned to them by the surveyed investors.

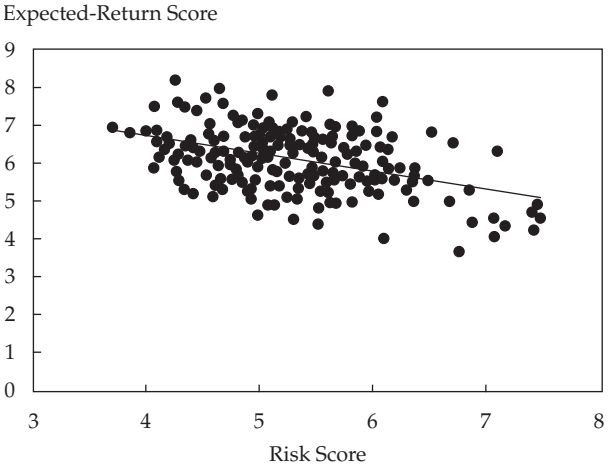
If investors' assessments of risk reflect objective risk alone, we should find a positive correlation between the risk scores and the return scores that they assigned to companies. As seen in **Figure 3**, however, the correlation between the two was negative: High return scores corresponded to low risk

Figure 2. Relationship between Affect Scores and *Fortune* Scores



Notes: Number of stocks = 210. *Fortune* score = 2.13 + 0.60(Affect score), with a *t*-statistic of 6.6; statistically significant at the 1 percent level. $R^2 = 0.17$.

Figure 3. Relationship between Expected-Return Scores and Risk Scores



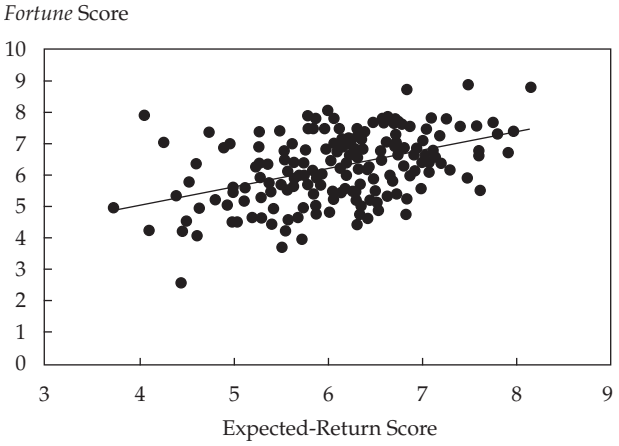
Notes: Number of stocks = 210. Expected-return score = 8.4 – 0.4 (Risk score), with a *t*-statistic of –7.2; statistically significant at the 1 percent level. $R^2 = 0.18$.

scores. This negative correlation indicates that investors' assessments of risk reflect subjective risk associated with affect. Positive affect creates a halo over stocks. Stocks with positive affect are assessed to be high as to future returns and low in risk, and stocks with negative affect are assessed to be low in future returns and high in risk.

We also found a link between return scores, risk scores, and *Fortune* scores. In a regression of *Fortune* scores on return scores, shown in **Figure 4**, we found that high *Fortune* ratings are associated with high return scores. The coefficient on the return scores is positive and statistically significant. Similarly, in a regression of *Fortune* scores on risk scores, shown in **Figure 5**, we found high *Fortune* ratings to be associated with low risk scores. The coefficient on the risk scores is negative and statistically significant.

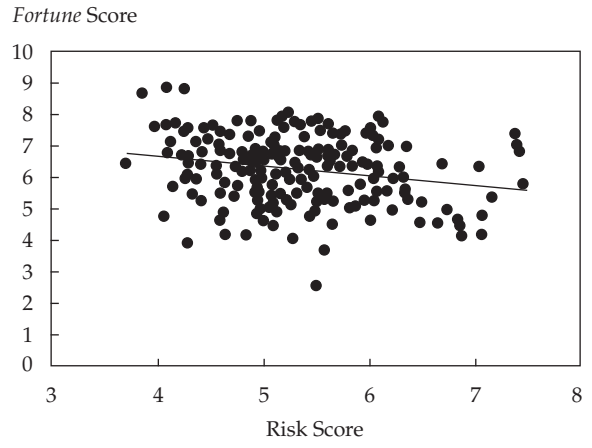
Objective risk measured by beta and subjective risk measured by affect are two factors in the behavioral asset-pricing model. But they are not the only factors. Short-term momentum is an especially interesting factor because its rationale is distinct from the rationale of affect.

Figure 4. Relationship between Expected-Return Scores and *Fortune* Scores



Notes: Number of stocks = 210. *Fortune* score = 2.7 + 0.6(Expected-return score), with a *t*-statistic of 6.8; statistically significant at the 1 percent level. $R^2 = 0.18$.

Figure 5. Relationship between Risk Scores and *Fortune* Scores



Notes: Number of stocks = 210. *Fortune* score = 8.0 – 0.3(Risk score), with a *t*-statistic of –3.3; statistically significant at the 1 percent level. $R^2 = 0.05$.

High short-term (12-month) momentum is positively correlated with affect, yet it is generally associated with *high* returns (Jegadeesh and Titman 1993). In contrast, large market capitalization is also positively correlated with affect but is generally associated with *low* returns. These relationships suggest that the relationship between short-term momentum and subsequent high returns might be the result of something other than affect. Indeed, the association between short-term momentum and returns was attributed by Grinblatt and Han (2005) to the "disposition effect," as described by Shefrin and Statman (1995), and was attributed by Sias (2007) to trading by institutional investors.

Investor Preferences and Stock Returns

The road from the perception that admired companies offer both high expected returns and low risk to the low realized returns of such stocks is not straight, as explained by Shefrin and Statman (1995) and by Pontiff (2006). Suppose typical investors prefer admired companies that they perceive as having both high expected returns and low risk. Surely, some investors, however, are contrarians who are aware of the preferences of typical investors and seek to capitalize on them by favoring stocks of spurned companies. Would arbitrage by these contrarians not nullify the effect of the typical investors on stock returns? If the effects of typical investors on stock returns are nullified by arbitrage, then subjective risk stemming from affect plays no role in the asset-pricing model. If arbitrage is incomplete, however, subjective risk does play a role in the asset-pricing model.

In considering arbitrage and the likelihood that it nullifies the effects of the preferences of typical investors on stock returns, keep in mind that no perfect (risk-free) arbitrage is possible. As some hedge funds and other unlucky investors found out, price gaps that are likely to close over a long period may widen farther over a shorter period. Risk makes arbitrage imperfect: Imagine a group of contrarians who know that the stocks of spurned companies have high expected returns relative to their objective risk. It is optimal for the contrarians to increase their holdings of stocks of spurned companies, but as the amount devoted to such stocks increases, the portfolios of the contrarians become less diversified and they take on more idiosyncratic risk. The increase in portfolio risk leads contrarians to limit the amount allocated to spurned stocks and, in so doing, to limit their effect on stock returns.

Conclusion

All asset-pricing models, whether of securities, cars, or watches, are versions of the basic model in which prices are determined by the intersection of demand and supply. The demand and supply functions reflect the preferences of consumers and producers.

The demand and supply structure is evident in the CAPM. In that model, investors on both the demand and supply sides prefer mean–variance-efficient portfolios, and the aggregation of their preferences yields an asset-pricing model in which expected returns of securities vary by beta. The demand and supply structure is not nearly as evident in the Fama and French three-factor asset-pricing model. Market capitalization and BV/MV were associated with anomalies relative to the CAPM long before the debut of the three-factor model, but the argument that size and BV/MV proxy for risk is not fully supported by the evidence.

The purpose of this article was to help link asset-pricing models to the preferences of investors. We outlined a behavioral asset-pricing model in which expected returns are high when objective risk is high and also when subjective risk is high. High subjective risk comes with negative affect, and low subjective risk comes with positive affect.

The study described here used the preferences of investors as reflected in surveys conducted by *Fortune* magazine during 1983–2006 and in additional surveys that we conducted in 2007. We found that the returns of admired stocks, those highly rated by the *Fortune* respondents, were lower than the returns of spurned stocks, those rated low. This result is consistent with the hypothesis that stocks with negative affect have high subjective risk and their extra returns compensate for that risk. We also found that market capitalization and BV/MV are correlated with affect, and we argued that those factors proxy for affect.

We found additional support for the hypothesis in the surveys that we conducted. Respondents in these surveys rated companies as if they believe that the stocks with high expected returns also have low risk, and respondents perceived the stocks of companies admired by *Fortune* respondents as having both high expected returns and low risk.

The behavioral asset-pricing model outlined here is not "superior" to the three- or four-factor models. Indeed, the factor models *are* behavioral models under their standard-finance skins. The affect factor in the behavioral asset-pricing model elucidates the rationale underlying the effects of the market-cap and BV/MV factors of the three-factor model.

The number of factors in a full model is likely to grow to include factors, such as liquidity, that are not included in the behavioral model or in the three- and four-factor models. Moreover, affect has several distinct sources, and these sources may play distinct roles in a behavioral asset-pricing model. Social responsibility is one source of positive affect. Prestige is another.

We would like to thank Ramie Fernandez, Hersh Shefrin, and Paul Slovic.

This article qualifies for 0.5 CE credit.

Notes

1. Part of the magnitude of the CAPM alphas in the Spurned and Admired portfolios is a result of equal weighting because equal weighting creates a small-cap tilt. Nevertheless, when value weighting was used, the CAPM alphas were lower in the Spurned and Admired portfolios than in the equally weighted portfolios but the alphas of the Spurned portfolios remained consistently higher than those of the Admired portfolios. When value weighting was used, the alphas of the Spurned portfolios were positive and statistically significant with the exception of the portfolio reconstituted every two years. In contrast, none of the alphas of the Admired portfolios was statistically significant.
2. We sent the questionnaire to 900 investors in three groups of 300 each. The list of stocks for each group consisted of 70 of the 210 companies in the survey. We received 170 completed questionnaires from the first group, 162 from the second, and 169 from the third, for a total of 501.
3. We sent the questionnaire to 1,800 investors in six groups of 300 each. The list of stocks for each group consisted of 70 of the 210 companies in the survey. Three groups received the return version of the questionnaire, and three received the risk version. We received 94, 91, and 94 completed questionnaires for the return versions and 134, 74, and 83 for the risk version, for a total of 570.

References

Cooper, Michael J., Orlin Dimitrov, and P. Raghavendra Rau. 2001. "A Rose.com by Any Other Name." *Journal of Finance*, vol. 56, no. 6 (December):2371–2388.

Cooper, Michael J., Ajay Khorana, Igor Osobov, Ajay Patel, and P. Raghavendra Rau. 2005. "Managerial Actions in Response to a Market Downturn: Valuation Effects of Name Changes in the Dot.com Decline." *Journal of Corporate Finance*, vol. 11, no. 1–2 (March):319–335.

Cosmides, Leda, and John Tooby. 2000. "Evolutionary Psychology and the Emotions." In *Handbook of Emotions*. 2nd ed. Edited by Michael Lewis and Jeannette M. Haviland-Jones. New York: Guilford Press.

Davis, J.L., E.F. Fama, and K.R. French. 2000. "Characteristics, Covariances, and Average Returns: 1929 to 1997." *Journal of Finance*, vol. 55, no. 1 (February):389–406.

Edmans, Alex, D. Garcia, and O. Norli. 2007. "Sports Sentiment and Stock Returns." *Journal of Finance*, vol. 62, no. 4 (August):1967–1998.

Fama, Eugene. 1970. "Efficient Capital Markets: A Review of Theory and Empirical Work." *Journal of Finance*, vol. 25, no. 2 (May):383–417.

Fama, Eugene F., and Kenneth R. French. 1992. "The Cross-Section of Expected Stock Returns." *Journal of Finance*, vol. 47, no. 2 (June):427–465.

Ganzach, Yoav. 2000. "Judging Risk and Return of Financial Assets." *Organizational Behavior and Human Decision Processes*, vol. 83, no. 2 (November):353–370.

Grinblatt, Mark, and Bing Han. 2005. "Prospect Theory, Mental Accounting, and Momentum." *Journal of Financial Economics*, vol. 78, no. 2 (November):311–339.

Hirshleifer, David, and Tyler Shumway. 2003. "Good Day Sunshine: Stock Returns and the Weather." *Journal of Finance*, vol. 58, no. 3 (June):1009–1032.

Hong, Harrison, and Marcin Kacperczyk. 2007. "The Price of Sin: The Effects of Social Norms on the Market." Working paper, Princeton University.

Hsee, C.K. 1998. "Less Is Better: When Low-Value Options Are Judged More Highly Than High-Value Options." *Journal of Behavioral Decision Making*, vol. 11, no. 2 (June):107–121.

Jegadeesh, Narasimham, and Sheridan Titman. 1993. "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency." *Journal of Finance*, vol. 48, no. 1 (March):65–91.

Kahneman, Daniel. 2002. "Maps of Bounded Rationality: A Perspective on Intuitive Judgment and Choice." Nobel Prize lecture (8 December): http://nobelprize.org/nobel_prizes/economics/laureates/2002/kahneman-lecture.html.

Lakonishok, Josef, Andrei Shleifer, and Robert W. Vishny. 1994. "Contrarian Investment, Extrapolation, and Risk." *Journal of Finance*, vol. 49, no. 5 (December):1541–1578.

Pontiff, Jeffrey. 2006. "Costly Arbitrage and the Myth of Idiosyncratic Risk." *Journal of Accounting and Economics*, vol. 42, no. 1–2 (October):35–52.

Shefrin, Hersh, and Meir Statman. 1995. "Making Sense of Beta, Size, and Book-to-Market." *Journal of Portfolio Management*, vol. 21, no. 2 (Winter):26–34.

Shiv, Baba, and Alexander Fedorikhin. 1999. "Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making." *Journal of Consumer Research*, vol. 26, no. 3 (December):278–292.

Sias, Richard. 2007. "Causes and Seasonality of Momentum Profits." *Financial Analysts Journal*, vol. 63, no. 2 (March/April):48–54.

Skinner, Douglas J., and Richard G. Sloan. 2002. "Earnings Surprises, Growth Expectations, and Stock Returns or Don't Let an Earnings Torpedo Sink Your Portfolio." *Review of Accounting Studies*, vol. 7, no. 2–3 (June–September):289–312.

Slovic, Paul, Melissa Finucane, Ellen Peters, and Donald G. MacGregor. 2002. "The Affect Heuristic." In *Heuristics and Biases: The Psychology of Intuitive Judgment*. Edited by Thomas Gilovich, Dale Griffin, and Daniel Kahneman. New York: Cambridge University Press.

Statman, Meir. 1999. "Behavioral Finance: Past Battles and Future Engagements." *Financial Analysts Journal*, vol. 55, no. 6 (November/December):18–27.

Statman, Meir, and Denys Glushkov. 2008. "The Wages of Social Responsibility." Working paper, Santa Clara University.

Welch, Ned. 1999. "The Heat of the Moment." Doctoral dissertation, Department of Social and Decision Sciences, Carnegie Mellon University.

Zajonc, R.B. 1980. "Feeling and Thinking: Preferences Need No Inferences." *The American Psychologist*, vol. 35, no. 2 (February):151–175.