



Sentiment and stock prices: The case of aviation disasters[☆]

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ABSTRACT

Behavioral economic studies reveal that negative sentiment driven by bad mood and anxiety affects investment decisions and may hence affect asset pricing. In this study we examine the effect of aviation disasters on stock prices. We find evidence of a significant negative event effect with an average market loss of more than \$60 billion per aviation disaster, whereas the estimated actual loss is no more than \$1 billion. In two days a price reversal occurs. We find the effect to be greater in small and riskier stocks and in firms belonging to less stable industries. This event effect is also accompanied by an increase in the perceived risk: implied volatility increases after aviation disasters without an increase in actual volatility.

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1. Introduction

Bad mood and anxiety may affect investor decisions; anxious people may be more pessimistic regarding future returns, tend to take less risk, or both. Anxiety creates a negative sentiment that can affect investment decisions and corresponding asset returns.¹ In this study we

examine large-scale aviation disasters. Our hypothesis is that aviation disasters affect people's mood and increase their anxiety which negatively affects the investment in risky assets. Therefore, we expect to observe negative rates of return in the stock market following aviation disasters. Indeed, we find significant evidence that aviation disasters negatively affect stock prices for a short period of a few days.

The effect found in this study encompasses both an event effect and a mean-reverting reversal effect two days after the event. There is more than one possible

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¹ Market sentiment, mood, and emotions are sometimes used in the literature interchangeably. However, market sentiment is a broader notion as it includes any misperception that can cause mispricing. It is broadly defined as "investors' belief about future cash flows and risk not justified by the facts at hand" (Baker and Wurgler, 2007, p. 129). The mood effect is therefore a special case of market sentiment. Also, as we

(footnote continued)

shall see in this study, people misperceived risk—which falls also in the category of market sentiment. To avoid confusion in the rest of the paper, we use the terms mood, anxiety, and fear interchangeably, as all these factors affect sentiment and can change investors' attitude toward risk.

interpretation of the investors' reaction to news of aviation disasters:

1. Investors who are “not fully rational” (see, e.g., Lee, Shleifer, and Thaler, 1991) react irrationally to the immediate news on aviation disasters and after two days revert back to their normal behavior. It is also possible that sophisticated investors exploit the relatively low prices; hence, a price reversal occurs.
2. Investors have a state dependent utility function of the type $U(C, X)$, where C stands for consumption and $X = 0, 1$ indicates the presence of negative sentiment following aviation disasters ($X = 1$) or the absence of negative sentiment ($X = 0$). Thus, if for example $U(C, 1)$ is characterized by a higher degree of risk aversion than $U(C, 0)$, our results can be explained within the expected utility framework. Yet, even in this case the switch between $U(C, 1)$ and $U(C, 0)$ falls in the category of behavioral economics, as mood affects preference and, in particular, it affects the degree of risk aversion.

Both the event effect and the reversal effect are examined in this study in various ways. This study shows that the effect is highly significant and remains intact under rigorous robustness checks. Fig. 1 presents the main findings of this study, the statistical analysis of which appears in the following sections.

Fig. 1 depicts the cumulative average residuals (CARs) around the dates when aviation disasters occurred. The figure shows that on the first day after a disaster ($t = 1$), when the media are typically flooded with disturbing pictures about the event and horrible stories about casualties (rather than when the occurrence of the disaster is known to some people), there is a sharp decline in average rates of return. This decline is almost 10 times larger in absolute terms than the average daily rate of return during the observed period. This decline represents

an average market loss of more than \$60 billion per aviation disaster, whereas the upper bound on the actual economic loss involved with these events is roughly estimated at \$1 billion per disaster. Moreover, we find that the event effect is followed by a reversal effect. On the third day after the event occurs ($t = 3$), there is an increase in returns that is about half the magnitude of the first day's decline. This reversal tendency persists for several days afterwards; the market fully reverts back to its mean average about 10 days after the decline.

What can one learn from the coexistence of the event effect and the reversal effect? If the market loss were due to the actual economic loss resulting from the disaster rather than due to the mood and anxiety effect, we would not expect to find a reversal effect at all. The fact that there is almost a complete price reversal is one more element in favor of our hypothesis asserting that excess anxiety induces the effect, and presumably when anxiety subsides or when sophisticated investors exploit the effect, a price reversal occurs.

To further study the event effect, we conduct several complementary analyses. First, we show that the decline in stock prices after aviation disasters is accompanied by a corresponding increase in perceived volatility, as measured by the VIX and VXO versions of the Fear Index, which has been proposed by Baker and Wurgler (2007) as a potential proxy for market sentiment. As we do not find a similar increase in actual volatility, this suggests that anxiety following aviation disasters affects the perception of volatility. Second, motivated by the prediction of Baker and Wurgler (2006) that a sentiment effect will be larger in stocks with valuations that are highly subjective and difficult to arbitrage, we test whether there is a difference in the magnitude of the effect in portfolios constructed by volatility, size, and industry. Indeed, we not only find the effect to be highly robust and to exist in all studied portfolios, but the results also conform to Baker and Wurgler's (2006) theory; a relatively larger event effect is

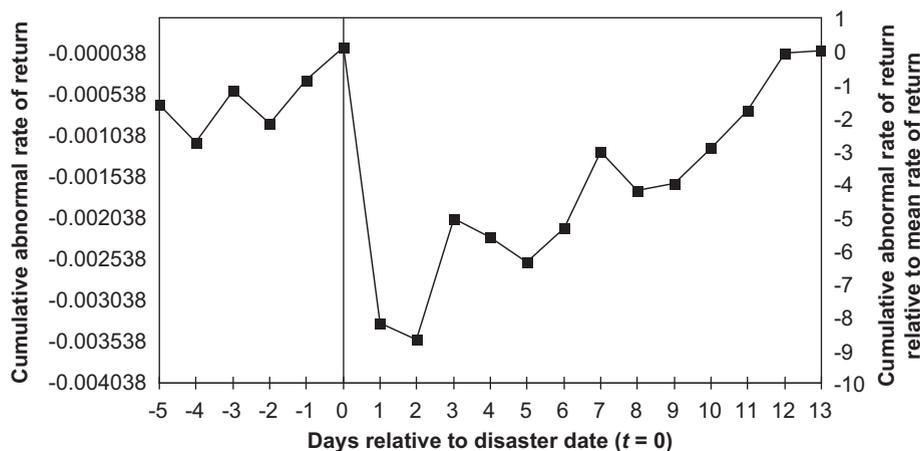


Fig. 1. Cumulative abnormal return. The figure depicts the cumulative average residuals (CAR) around the event date ($t=0$). The average residual on day t is calculated as the average rate of return on day t , minus the mean rate of return on all days (i.e., minus the average rate of return on all days from $t=-5$ to $t=13$) on the NYSE Composite Value-Weighted Index, which is equal to 0.0004038. For presentation purposes, the axis on the left-hand side corresponds to the abnormal rate of return, while the axis on the right-hand side corresponds to the abnormal rate of return relative to the mean rate of return (i.e., the values on the left-hand side are divided by the mean rate of return of 0.0004038). The events occurred during a 58-year period from January 1950 to December 2007 and include 170 event days of disasters of American and European airline companies.

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