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The persistent effects of a false news shock☆

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ABSTRACT

In September 2008, a six-year-old article about the 2002 bankruptcy of United Airlines' parent company resurfaced on the Internet and was mistakenly believed to be reporting a new bankruptcy filing by the company. This episode caused the company's stock price to drop by as much as 76% in just a few minutes, before NASDAQ halted trading. After the "news" had been identified as false, the stock price rebounded, but still ended the day 11.2% below the previous close. We explore this natural experiment by using a simple asset-pricing model to study the aftermath of this *false news shock*. We find that, after three trading sessions, the company's stock was still trading below the two-standard-deviation band implied by the model and that it returned to within one standard deviation only during the sixth trading session. On the seventh day after the episode, the stock was trading at the level predicted by the asset-pricing model. We investigate several potential explanations for this finding, but fail to find empirical evidence supporting any of them. We also document that the false news shock had a persistent negative effect on the stock prices of other major airline companies. This is consistent with the view that contagion effects would have dominated competitive effects had the bankruptcy actually taken place.

1. Introduction

A central question of financial economics is whether markets are efficient. Among other things, market efficiency requires that asset prices react to news about fundamentals, as opposed to noise. However, in most circumstances relevant information and noise arise simultaneously, and cannot be easily separated. Agents have to make inference about fundamentals from possibly noisy pieces of information, and thus the noise component usually affects agents' investment decisions. In this paper we explore a natural experiment that allows us to study a stock market's reaction to an information release for which the noise component can be singled out very cleanly.

On September 8, 2008, an old article about the 2002 bankruptcy of United Airlines' parent company (henceforth UA) resurfaced on the Internet and was mistakenly believed to be reporting a new bankruptcy filing by the company.[1] This caused the company's stock price to drop by as much as 76% in just a few minutes, before NASDAQ halted trading. After the false news had been identified as such, the stock price rebounded, but still ended the day 11.2% below the previous close. Trading volumes skyrocketed during these extreme price movements.

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[1] Although the article referred to United Airlines' parent company (UAL Corp.), throughout the paper we refer to the episode as pertaining to United Airlines. UAL Corp. was traded at NASDAQ under the ticker symbol "UAUA" at the time of the episode. In October 2010, UAL Corp. completed a merger with Continental Airlines Inc. The new United Continental Holdings, Inc. trades under the ticker symbol "UAL".

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The episode can be thought of as comprising two pieces of information: the "news" that UA had filed for bankruptcy protection again, and the subsequent statements by UA and the media companies involved in the article's release clarifying that it pertained to the 2002 bankruptcy filing. The clarification statements were widely circulated shortly after the large price drop, and were publicly available when trading resumed. Moreover, the false news appears to have made its way to the main sources of financial information by sheer accident. This justifies our assumption that the episode provides a natural experiment to study the effects of what we refer to as a *false news shock*: two pieces of information that cancel each other. Given this shock, we are left with the task of trying to make sense of the 11.2% drop of UA's stock price on that day and its slow recovery on subsequent days.

In order to study the impact of the false news shock on UA's stock price, we need a so-called "counterfactual": the path that the stock price would likely have followed in the absence of the false news. In Section 3 we construct such a counterfactual path using a simple factor pricing model for UA's stock return. In particular, we postulate that the excess return on UA stock depends linearly on the excess returns of three factors: the "market" (as proxied by the S&P 500), the "airline industry" (as proxied by Bloomberg's World Airline Index), and crude oil. We estimate the asset-pricing model using data until the day before the false news impacted the market. The model captures the dynamics of UA excess returns quite well, explaining about 40% of its variation at both daily and intraday frequencies. We use our model to construct point estimates and standard-error bands for UA's stock price given the evolution of the three pricing factors on the day of the false news event, and over subsequent trading sessions.

We find that after three trading sessions UA shares were still trading below the two-standard-deviation band implied by the model, and only returned to within one standard deviation of the model-implied price on the sixth trading session after the event. On the seventh day after the episode — and for quite a few days thereafter — the shares traded essentially at the level predicted by the asset-pricing model. These findings are robust to different specifications of the factor model.

Throughout our analysis we maintain the assumption that the two pieces of information that comprise the false news shock exactly cancel each other, in the sense that after the clarification statements investors fully understood that the article was six years old, and that UA had not filed for bankruptcy protection again. However, it is possible that the false news shock had indirect asset-pricing effects not captured by our factor model — e.g., by affecting the liquidity of UA shares or investors' views about the quality of information about UA's fundamentals. We explore these possibilities in Section 5. However, we fail to find empirical evidence that is supportive of the theory-based explanations that we entertain. In that section we also investigate a more idiosyncratic potential explanation, motivated by the special circumstances in which the episode took place — namely, in the week before the bankruptcy of Lehman Brothers. Specifically, we consider the possibility that UA's financial conditions around that time made it particularly susceptible to changes in market perceptions about the health of the U.S. financial sector, due to high borrowing needs in a context of tightening borrowing constraints and lending standards. We augment the asset-pricing model with a factor that captures the market's assessment of U.S. banks' health, and repeat our counterfactual analysis.[2] While the financial factor comes out as extremely statistically significant, it does not affect any of our conclusions, as the changes in the estimated counterfactual and error bands are negligible.

In Section 6 we analyze the evolution of the stock prices of other major U.S. airlines during the episode (American Airlines, Continental Airlines, Delta Airlines and U.S. Airways). We find a very similar, although attenuated, pattern. On September 8, 2008, their share prices experienced maximum drops in the range of −25.6% to −31.8%, and ended the day between −2.5% to −5.3% relative to the previous closing price. The timing of the sharp price moves coincides with UA's. Employing the same type of factor pricing model as for UA, we construct a counterfactual path for the stock price of each of these four companies and find that the effects of the false news shock originated from the article on UA were also persistent. Finally, we document that intraday trading volumes for all five stocks spiked up considerably during the sharp price movements. We discuss our findings in the context of the literature on the "contagion and competitive effects of bankruptcy" (e.g. Lang and Stulz, 1992).

Our paper adds to the available evidence on systematic deviations from informationally frictionless and efficient markets. Huberman and Regev (2001) document that a front-page New York Times article about an old scientific discovery had a huge impact on the stock price of the company responsible for it (EntreMed), even though the scientific findings had been published in *Nature* and covered by a not-so-prominent New York Times article more than five months before. The prominent article also had spillover effects on the stock prices of other biotechnology companies. The authors conclude that "enthusiastic public attention" may induce important movements in stock prices in response to old news that may have been overlooked by a large fraction of market participants.

Like Huberman and Regev (2001), our paper provides very clean evidence on the importance of media vehicles in transmitting information to market participants and affecting how they perceive the world. While it is usually taken for granted that people receive and act on information transmitted by various media outlets, most models have no role for them — information is simply "received" (or inferred) by agents without any reference to concrete communication channels. There is, however, a growing body of literature that aims at estimating the asset-pricing impact of news identified through application of linguistic tools to newspaper articles. Tetlock (2007) constructs a media-based measure of "sentiment" towards stock markets from a linguistic analysis of the Wall Street Journal's "Abreast of the Market" column. He finds that high negative sentiment predicts lower returns for the Dow-Jones index over the next few days followed by a reversion, and that unusually high or low pessimism predicts high trading volume. Sinha (2009) uses a sentiment score from Thomson-Reuters to measure the tone of news articles and constructs portfolios based on past sentiment. He finds that a portfolio long in positive- and short in negative-sentiment firms is positively correlated with a long-short momentum portfolio and generates positive returns. Tetlock et al. (2008) use the fraction of negative

[2] We thank an anonymous referee for suggesting this potential explanation to us.