The "Blowout Effect": An Analysis of the Financial Impact of a Near Catastrophic Aviation Event

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On January 5, 2024, a door plug blew out of an Alaska Airlines flight midair, leaving a hole the size of an emergency exit in the hull of the plane. Boeing and Spirit AeroSystems were found jointly responsible for this mishap, which grounded hundreds of flights. This situation raises an important question about which firms in the commercial aviation industry suffer the most from near catastrophes. This paper examines the "Blowout Effect" of this disaster on the commercial aviation industry and on two sectors: (i) aircraft manufacturers and (ii) airline companies. We use an event study methodology to analyze the returns of 19 aviation firms. The "Blowout Effect" did negatively impact share values across the commercial aviation industry, with a nearly 5% loss in company value. Additionally, every airline company experienced a financial loss, even though none of them were assessed any fault in the near catastrophic event. We find the 19 aviation firms cumulatively lost $27 billion of market capitalization which we attribute to the "Blowout Effect."

Keywords: airline industry, aviation accidents, reputational risk, event study

INTRODUCTION

On the evening of January 5, 2024, a door plug blew out of an Alaska Airlines flight as it climbed toward cruising altitude, immediately depressurizing the plane and leaving a gaping hole in the body of the aircraft. While the plane successfully executed an emergency landing with no loss of life, an event like this seems more fit for the movies than real life! While maybe not as sensational as a crash, the situation had to be absolutely terrifying for those passengers on board. In an age where such events are recorded, posted on social media, and viewed by millions, the incident plays into a common fear of flying. Additionally, if any

variables had been different, such as passengers sitting in the seats near the door plug or the plane reaching cruising altitude before the door plug blowout, the results would have been catastrophic.

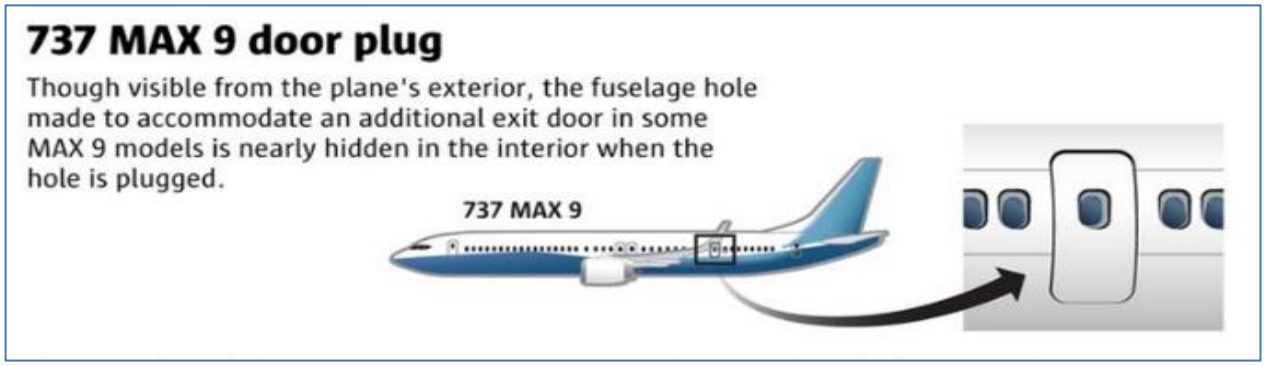
It took a couple of weeks to identify the likely cause of the failure. Although the initial news reports (and some of the social media posts) called out Alaska Airlines, the near disaster was due to the failure of Spirit AeroSystems, a parts manufacturer, to supply the bolts required to keep the door plug attached to the fuselage of the aircraft. Boeing also took a lot of heat for neglecting to properly inspect the plane and verify that the door plug was secure. In fact, a later report indicated that Boeing had lost the paperwork regarding this critical part of the inspection on this specific aircraft (Tangel, 2024). Few people have probably heard of the company Spirit AeroSystems or understand their role in the commercial aviation industry's supply chain. People are undoubtedly more familiar with Alaska Airlines and other carriers over aircraft manufacturers. Therefore, it seems likely that the financial markets would associate failure in the assembly process with the airlines rather than the party responsible - the aircraft manufacturers. This situation advances an important question: Which companies suffer the most from aviation incidents, manufacturers or airlines?

Using an event study approach, this paper analyzes the immediate financial impact of Alaska Airline's traumatic incident on two sectors within the commercial aviation industry: aircraft manufacturers and the airline companies who buy aircraft to put them into service. Even though Alaska Airlines was not found responsible, the association of their name with this near tragedy may have affected their share value after the event. This study aims to show whether an aviation company that experiences a near disaster for which it's not responsible suffers a similar change in market value as the parties ultimately held responsible.

A BRIEF EVENT TIMELINE AND REVIEW OF RELEVANT LITERATURE

On Friday, January 5, 2024, just before 5pm Pacific Time (8pm Eastern Time), Alaska Airlines flight 1282 took off from Portland, Oregon. About 10 minutes into the flight as the plane was climbing higher than 16,000 feet in altitude, a door plug blew off the Boeing 737 MAX 9 aircraft, leaving a gaping hole in the fuselage, instantly depressurizing the plane, and forcing the plane back to Portland for an emergency landing (Sider & Michaels, 2024).

FIGURE 1
VISUAL DESCRIPTION OF THE 737 MAX 9 DOOR PLUG



From "Alaska, United Find Loose Hardware During Inspection of 737 MAX 9s" by Dominic Gates, January 8, 2024, *The Seattle Times* (https://www.seattletimes.com/business/boeing-aerospace/united-finds-loose-bolts-on-door-plug-when-inspecting-its-max-9s). Copyright 2024 by *The Seattle Times*.

Although Alaska Airlines was the initial focus of the incident, this focus shifted based on additional information following the blowout. The missing door plug was recovered from a backyard in Portland on Sunday, January 7th (Sider et al., 2024). The National Transportation Safety Bureau reported on Monday, January 8th that bolts to keep the door plug in place were missing, and there was a question as to whether

they had ever been installed at all (Tangel, 2024). The attention then shifted from Alaska Airlines to Boeing as the aircraft manufacturer of the 737-series aircraft, and to Spirit AeroSystems as the component parts manufacturer of that aircraft.

The operational fallout from the door blowout was swift and immediate. The FAA grounded all Boeing 737 MAX 9 aircraft to inspect for loose parts, effectively taking nearly 200 aircraft out of service. United Airlines had the largest fleet of MAX 9 aircraft at 79 jets, requiring cancellation of 270 flights over the weekend. Alaska Airlines had fewer MAX 9's (65 jets) to ground, but these jets accounted for a higher percentage of their aircraft fleet. They were forced to cancel 330 flights over the weekend (Sider & Michaels, 2024). This event undoubtedly frustrated tens of thousands of air travelers. Clearly, this incident impacted airline carriers other than Alaska Airlines in a significant way as well.

The fallout was also immediate from a financial perspective. Both Boeing and Spirit AeroSystems suffered lower stock prices on the Monday following the event (Tangel et al., 2024). Previous studies have shown how sensational media coverage surrounding aviation disasters increases investor anxiety and negatively affects the overall stock market in general (Kaplanski & Levy, 2010). Unsurprisingly, those involved in the commercial aviation industry face more significant outcomes than other industries. Aircraft manufacturers tend to see a considerable market drop in the days following a crash, and the decline is even deeper and takes longer to recover from when the aircraft manufacturer faces some fault in the incident (Krieger & Chen, 2015).

Additional studies document greater impacts on the airlines than the aircraft manufacturers. One study focused specifically on aircraft engine manufacturers found that the airlines are more immediately and negatively affected by a disaster than the engine manufacturers, possibly due to contagion and reputational risk (Akyildirim et al., 2021). Another study using an aggregation of aviation disaster data showed that the airlines themselves suffer more than the aircraft manufacturers immediately after the disaster, particularly if the event occurred in the United States (Walker et al., 2005).

Reputational risk has become paramount in the age of increased information and should be factored into organizational strategy (Scott & Walsham, 2005). Corporations with higher degrees of risk face the expectation of higher returns from their investors and must therefore consider how reputational risk may influence their return values (Beck et al., 2022). While the flying public may not know whether they are riding in a Boeing aircraft, an Airbus, or even an Embraer Canada Regional Jet, investors are aware of the fleet makeup and the alliances between the airline and aircraft manufacturer.

When a corporation is found partially or fully at fault for an aviation disaster, the stock price is expected to drop. However, even when the company responsible is an aircraft manufacturer versus an airline, the negative results also appear to affect the airlines. One study found that aviation disasters resulted in lower share prices the first day of trading after the disaster and continued their decline for a week (Walker et al., 2014). A more recent aviation disaster study suggested that media attention for negative airline events can impact air travel behavior more than actual statistics (Van der Meer et al., 2019). This finding implies that media reports covering a malfunction focused on the affected airline involved more than the aircraft manufacturers that assembled the plane. This coverage could lead investors to blame the airline over the manufacturer, affecting the airline's market value more deeply. Investor behavior may be affected by their skewed perception of which party is at fault for the disaster and by reputational risk within a high-risk industry. Given those considerations, therefore, whose stock price is most adversely affected after an aviation accident?

Another factor that must be considered in the current situation is the proliferation of social media. In the over 20-year period since the tragedy of 9-11, cell phones have become ubiquitous, allowing anyone to record and post events in real time. This was the case of the Alaska Airlines flight on January 5; media outlets such as CNN picked up the video posted to social media by passengers on the plane (see https://www.cnn.com/2024/01/06/us/passengers-alaska-airlines/index.html). Although no one was seated in the immediate area of the door blowout, the public could get an almost first-hand experience of the terrifying flight through pictures and video posted to social media. Such media accounts likely play into the fears that many have about flying. Suppose the public feels that flying presents an opportunity for disaster (particularly after a disaster occurs). In that case, they lose faith in the airline – especially if they feel that

the airline was at fault to any degree (Yang et al., 2018). This is likely related to investor sentiment and resulting behavior. Negative media attention, including that posted via social media, is related to reputational risk and lowered stock prices (Becchetti et al., 2022).

The Alaskan Airlines incident, while traumatic, had a good ending for the passengers with a safe emergency landing and no loss of life. Conversely, the financial impact of this incident on the aircraft manufacturers and airline companies has not been as favorable.

RESEARCH DESIGN AND HYPOTHESIS DEVELOPMENT

We explain the research design and hypothesis development of our study in the following sections: event window, data, research questions and hypotheses.

Event Window

Alaska Airlines flight 1282 took off on Friday, January 5, 2024, shortly before 8:00 pm Eastern Time. One of the door plugs unexpectedly blew out a few minutes into the flight, causing the plane to immediately depressurize and forcing an emergency landing. No one expects part of an airplane to fall off during flight; this was clearly an unanticipated event. Since the markets couldn't react to this incident until Monday, January 8, 2024, this date is defined as the event date (t = 0). A five-day event window of January 8 to January 12, 2024, is used to assess the "Blowout Effect" (see Table 1).

TABLE 1
EVENT WINDOW FOR THE "BLOWOUT EFFECT"

Event day	0	1	2	3	4
Calendar date	1/8/2024	1/9/2024	1/10/2024	1/11/2024	1/12/2024

Data

The commercial aviation industry is relatively concentrated, with only a handful of aircraft manufacturers and airline companies putting the aircraft into the service of mass transportation. While this gives us a relatively limited sample size, the neatly defined event window eliminates issues related to leakage often surrounding an event based on the arrival of new regulation.

To isolate the "Blowout Effect" on commercial aviation companies, there should be no other major new announcements related to any of the companies examined in this study. To satisfy this condition, we review *The Wall Street Journal* for additional news related to these companies and find that no other relevant news was reported during the time frame under study. The aviation firm must be publicly traded and have daily returns over the event window.

After the screening process, there are 19 aviation firms in our sample; they are listed in Appendix 1. The sample has ten firms that are classified as aircraft manufacturers, including Boeing and Spirit AeroSystems, the two firms determined to be at fault for the "Blowout Effect." Boeing is the largest firm in the sample with a market capitalization of $158 billion and annual revenues of $78 billion. Spirit AeroSystems is one of the smallest firms with a market capitalization of $3.7 billion and annual revenues of $6 billion. Other aircraft manufacturers include well-known firms including Airbus, Lockheed Martin, Northrop Grumman, GE Aerospace, General Dynamics, Honeywell International, and RTX (the parent company of Raytheon, Collins Aerospace, and Pratt & Whitney).

The other nine firms in the sample are airline companies, including Alaska Airlines, whose flight encountered the "Blowout Effect." The sample also includes the three major legacy airlines: American Airlines, Delta Air Lines, and United Airlines. The sample also includes five low-cost airlines: Allegiant Air, Frontier Airlines, JetBlue Airways, Southwest Airways, and Spirit Airlines. Delta Air Lines is the largest airlines company with a market capitalization of $26 billion and revenues of $74 billion. Alaska

Airlines is one of the smaller airline companies with a market capitalization of $5 billion and revenues of $15 billion.

Research Questions and Hypotheses

The research question is whether the "Blowout Effect" resulted in a significant loss in stock price to the airline companies, even though the aircraft manufacturers were ultimately found responsible. We examine the stock returns of the commercial aviation industry, the aircraft manufacturers, and the airline companies via the following hypotheses.

H_1: *The stock returns (cumulative abnormal returns) of the commercial aviation industry attributed to the "Blowout Effect" are different from zero.*

H_2: *The percentage of negative stock returns (cumulative abnormal returns) of the commercial aviation industry attributed to the "Blowout Effect" are different from fifty percent.*

H_3: *The stock returns (cumulative abnormal returns) of the aircraft manufacturers attributed to the "Blowout Effect" are different from zero.*

H_4: *The percentage of negative stock returns (cumulative abnormal returns) of the aircraft manufacturers attributed to the "Blowout Effect" are different from fifty percent.*

H_5: *The stock returns (cumulative abnormal returns) of the airline companies attributed to the "Blowout Effect" are different from zero.*

H_6: *The percentage of negative stock returns (cumulative abnormal returns) of the airline companies attributed to the "Blowout Effect" are different from fifty percent.*

A parametric t-test and a non-parametric Wilcoxon signed rank test are used to determine if the cumulative abnormal returns are different from zero to test the odd numbered hypotheses. To test the even-numbered hypotheses, we used a binomial t-statistic to test that the number of negative cumulative abnormal returns are not equal to fifty percent. The non-parametric tests address issues related to small samples and non-normally distributed data.

METHODOLOGY

An event study approach is used to evaluate the stock market reaction to this very unusual incident that we have named the "Blowout Effect." An event study attempts to isolate changes in stock prices due to a specific event affecting the profitability outlook of the business (Wells, 2004). This methodology is often used in the analysis of different types of sudden disruptions, including major utility infrastructure disruptions (i.e., Feria- Domínguez et al., 2016; Scholtens & Boersen, 2011); natural disasters (i.e., Feria-Domínguez et al., 2017), and other aviation disasters (i.e., Kaplanski & Levy, 2010; Walker et al., 2014). More specifically, event methodology is particularly appropriate to this study, given the unpredictability of an airline crash (Davidson et al., 1987). Thus, an event study is the logical approach for this study.

This efficient market theory, advanced by Fama (1970), forms the basis of the event study methodology. Efficient markets imply that a firm's stock price is based on trading activity that incorporates publicly available information. We calculate a normal return for each day in the event window for each company. The normal return is what an investor would expect to earn in absence of the "Blowout Effect." Since the return on the stock market index is typically considered a proxy for the normal return, the return on the S&P 500 Index is used here as a proxy for the normal return. The abnormal return is calculated for each company for each day over the event window and is attributed to the impact of the "Blowout Effect." The calculation for the daily abnormal return is:

$$Ar_{it} = R_{it} - R_{mt} \quad (1)$$

where R_{it} is the stock return for aviation firm *i* on day *t*, and R_{mt} is the return on the S&P 500 Index on day *t*.

The effect of the event on stock prices may linger for days after the event, which requires analysis of the cumulative abnormal return over the course of the event window. This study considers the cumulative abnormal return for each aviation firm for the five days following the door plug failure. The calculation for the cumulative abnormal return (CAR) is:

$$CAR_i = \sum_{t-0}^{t+4} AR_{it} \quad (2)$$

where AR_{it} is the abnormal return of aviation firm *i* on day *t*.

The mean CAR and the median CAR are evaluated for significance. If the January 5th incident didn't impact stock prices, any firm posting positive returns would be offset by negative returns of other firms. This would result in both the mean and median values for the CAR not being significantly different from zero. The proportion of negative returns is also compared to the number of positive returns; if the January 5th incident had no effect on the commercial aviation industry, the percentage of negative returns should not differ significantly from the expected fifty percent. We employ t-tests to evaluate the significance of these differences as well as the Shapiro-Wilk test to assess the normality of this small group of firms.

RESULTS

Below we discuss the results for the commercial aviation industry, sector effect, and size effect.

Commercial Aviation Industry

After analyzing the returns of the 19 firms in the commercial aviation industry, we find that the "Blowout Effect" had a significant negative effect. As shown in Table 2, the commercial aviation industry's mean and median CARs were -4.98% and -4.00%, respectively. Additionally, almost 80% of the commercial aviation firms experienced a negative CAR. All three tests are statistically and economically significant. It is also noteworthy that every airline company in the sample had a negative CAR.

The results clearly indicate that even in the absence of a crash or loss of life, the "Blowout Effect" significantly negatively affected the commercial aviation industry. The "Blowout Effect" cost the commercial aviation industry a nearly 5% decline in stock prices. When we calculate the absolute dollar impact of the "Blowout Effect", the commercial aviation industry's mean and median market capitalization losses are $1.42 billion and $400 million, respectively. The 19 aviation firms lost $27 billion in market capitalization, which we attribute to the "Blowout Effect." Our results support the assertion that the "Blowout Effect" dramatically impacted the commercial aviation industry.

TABLE 2
COMMERCIAL AVIATION INDUSTRY: AVERAGE CUMULATIVE ABNORMAL RETURNS (CAR) AND PERCENT NEGATIVE CARS DUE TO THE "BLOWOUT EFFECT"

N = 19	"Blowout Effect"
Mean $CAR_{0,+4}$	-4.98%***
t-statistic	-3.73
Median $CAR_{0,+4}$	-4.00%***
Wilcoxon signed rank test	20
Percent negative CARs	78.95%**
binomial t-statistic	2.52

***, ** denote one and five percent significance levels, respectively.

Sector Effect: Aircraft Manufacturers and Airline Companies

In this section we analyze two sectors of the commercial aviation industry: (i) aircraft manufacturers and (ii) airline companies. As we noted earlier, each of the airline companies experienced negative CARs from the "Blowout Effect," so there appears to be a sector effect. The firms in each sector are identified in Appendix 1.

Aircraft Manufacturers

While the aircraft manufacturers experienced negative returns from the "Blowout Effect," neither the mean nor median CARs were statistically significant, as shown in Table 3. Additionally, the percentage of negative CARs were not significantly different than 50 percent. Even though Boeing and Spirit AeroSystems experienced negative CARs of -14.87% and -16.28%, respectively, the overall sector did not suffer significant losses from the "Blowout Effect." One firm, Airbus, experienced a gain in stock price with a CAR of 5.23%. It appears there might be a competitor effect, in that bad news for Boeing meant good news for their competitor, Airbus.

TABLE 3
SECTOR EFFECT: AVERAGE CUMULATIVE ABNORMAL RETURNS (CAR) AND PERCENT NEGATIVE CARS OF AIRCRAFT MANUFACTURERS AND AIRLINE COMPANIES DUE TO THE "BLOWOUT EFFECT"

	"Blowout Effect"
Aircraft manufacturers, n = 10	
Mean $CAR_{0,+4}$	-2.95%
t-statistic	-1.33
Median $CAR_{0,+4}$	-0.54%
Wilcoxon signed rank test	18
Percent negative CARs	60.00%
(binomial t-statistic)	0.63
Airline companies, n = 9	
Mean $CAR_{0,+4}$	-7.23%***
t-statistic	-6.75
Median $CAR_{0,+4}$	-6.61%**
Wilcoxon signed rank test	0
Percent negative CARs	100.00%**
(binomial t-statistic)	3.00

***, ** denote one and five percent significance levels, respectively.

Airline Companies

On the other hand, the airline companies experienced statistically significant losses from the "Blowout Effect" as evidenced by the mean and median CARs. Table 3 shows that airline companies incurred major losses with a mean and median CAR of -7.23% and -6.61%, respectively. Additionally, 100 percent of the firms in this sector experienced a negative CAR. While Southwest Airlines suffered the least degree of loss to their stock price with a -3.74% CAR, Alaska Airlines suffered a major loss with a -9.31% CAR. Even though Alaska Airlines did everything right with emergency protocol and managed to safely land a plane with a major hole in its side, the "Blowout Effect" significantly impacted its stock price as well as that of the other airlines.

Size Effect

We analyze the data for a size effect because firms of different sizes may react differently to the "Blowout Effect." For example, large firms found liable for an aviation disaster may be able to handle the financial losses associated with the event. Conversely, an aviation disaster might have a crushing effect on

small firms. We compare the eight largest firms with market capitalizations greater than $70 billion versus those with smaller than $10 billion. The large and small firms are identified in Appendix 1.

We find a strong small-firm effect where small firms suffered much larger and significant losses than the larger firms. Table 4 shows collectively small firms experienced much greater losses with a mean CAR of -8.06% significant at the 1% level and a median CAR of -7.88% significant at the 5% level. The large firms experienced smaller mean and median CARS of -1.71% and -0.54%, respectively, and neither were significant. Additionally, 88% of the small firms experienced a negative CAR versus 63% of the large firms. The "Blowout Effect" is much more pronounced for smaller firms in the commercial aviation industry.

TABLE 4
AVERAGE CUMULATIVE ABNORMAL RETURNS (CAR) AND PERCENT NEGATIVE CARS OF LARGE AND SMALL COMPANIES DUE TO THE "BLOWOUT EFFECT"

	"Blowout Effect"
Large firms, n = 8	
Mean $CAR_{0,+4}$	-1.71%
t-statistic	-0.83
Median $CAR_{0,+4}$	-0.54%
Wilcoxon signed rank test	13
Percent negative CARs	62.50%
binomial t-statistic	0.71
Small firms, n = 8	
Mean $CAR_{0,+4}$	-8.06%***
t-statistic	-4.22
Median $CAR_{0,+4}$	-7.88%**
Wilcoxon signed rank test	1
Percent negative CARs	87.50%*
binomial t-statistic	2.12

Small and large firms have market capitalization of <$10 billion and >$70 billion, respectively.
***, **, and * denote one, five, and ten percent significance levels, respectively.

CONCLUSION

Aviation mishaps often suggest crashing planes and loss of life, and most would expect a major financial fallout from such events. But what about a near-catastrophic aviation mishap where there is no crashing plane or loss of life? This study finds that a near-catastrophic aviation mishap also results in a major financial fallout for all firms in the commercial aviation industry. One January night in 2024, an Alaska Airlines flight suffered a door blowout which resulted in only an emergency landing; there was no plane crash or loss of life. We name this near-catastrophic aviation event the "Blowout Effect" and examine its financial impact on the commercial aviation industry and two sectors: aircraft manufacturers and airline companies.

Using an event study, we find the commercial aviation industry suffered nearly a 5 percent loss in market capitalization from the "Blowout Effect." When we examine the absolute dollar amount of market capitalization lost, we find the mean and median market capitalization losses to be $1.42 billion and $400 million, respectively, for commercial aviation firms. The 19 commercial aviation firms in our sample lost a staggering $27 billion in market capitalization from the "Blowout Effect."

Boeing and Spirit AeroSystems, both aircraft manufacturers, were found jointly responsible for the "Blowout Effect." Surprisingly, despite this determination, aircraft manufacturers did not suffer significant financial losses from the "Blowout Effect." Conversely, all airline companies, not just Alaska Airlines, did suffer financial losses. We find airline companies' mean and median CAR to be significant at -7.23% and -

6.61%, respectively. Additionally, 100% of the airline companies studied experienced a negative CAR from the "Blowout Effect." Our research shows that airline companies suffer reputational risk even from an event where one of their suppliers is determined to be at fault. Investors undoubtedly expect airline companies to exhibit high due diligence in selecting competent suppliers.

The conclusions drawn in this paper will benefit risk managers of airline companies in several important ways. Our research findings document not only the staggering costs of a near-catastrophic aviation event on airline companies but also suggest a loss of reputational capital due to negligence by the aircraft manufacturers on whom airline companies rely to build safe aircraft. Strategic supply chain alliances with aircraft manufacturers are vital to the success of airline companies. Future research should further address this issue.

REFERENCES

Akyildirim, E., Corbet, S., O'Connell, J., & Sensoy, A. (2021). The influence of aviation disasters on engine manufacturers: An analysis of financial and reputational contagion risks. *International Review of Financial Analysis*, *74*, 1–17. https://doi.org/10.1016/j.irfa.2020.101630

Becchetti, L., Ciciretti, R., Hasan, I., La Licata, G. (2022). Environmental reputational risk, negative media attention and financial performance. *Financial Markets, Institutions and Instruments*, *31*(4), 123–145. https://doi.org/10.1111/fmii.12163

Beck, K., Chong, J., & Niendorf, B. (2022). Investment returns from reputation investing: Do good firms provide good returns? *American Journal of Business*, *37*(3), 109–119. https://doi.org/10.1108/AJB-06-2021-0070

Davidson, W., III, Chandy, P., & Cross, M. (1987). Large losses, risk management and stock returns in the airline industry. *The Journal of Risk and Insurance*, *54*(1), 162–172. https://doi.org/10.2307/252888.

Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, *25*(2), 383–417. https://doi.org/10.1111/j.1540-6261.1970.tb00518.x

Feria-Domínguez, J., Paneque, P., & Gil-Hurtado, M. (2017). Risk perceptions on hurricanes: Evidence from the U.S. stock market. *International Journal of Environmental Research and Public Health*, *14*(6), 1–18. https://doi.org/10.3390/ijerph14060600

Feria-Domínguez, J., Jiménez-Rodríguez, E., & Fdez-Galiano, I. (2016). Financial perceptions on oil spill disasters: Isolating corporate reputational risk. *Sustainability*, *8*(11), 1–15. https://doi.org/10.3390/su8111090

Gates, D. (2024, January 8). Alaska, United find loose hardware during inspection of 737 MAX 9s. *The Seattle Times*. Retrieved from https://www.seattletimes.com/business/boeing-aerospace/united-finds-loose-bolts-on-door-plug-when-inspecting-its-max-9s/

Kaplanski, G., & Levy, H. (2010). Sentiment and stock prices: The case of aviation disasters. *Journal of Financial Economics*, *95*(2), 174–201. https://doi.org/10.1016/j.jfineco.2009.10.002

Krieger, K., & Chen, D. (2015). Post-accident stock returns of aircraft manufacturers based on potential fault. *Journal of Air Transport Management*, *43*, 20–28. https://doi.org/10.1016/j.jairtraman.2015.01.002

Scholtens, B., & Boersen, A. (2011). Stocks and energy shocks: The impact of energy accidents on stock market value. *Energy*, *36*(3), 1698–1702. https://doi.org/10.1016/j.energy.2010.12.059

Scott, S., & Walsham, G. (2005). Reconceptualizing and managing reputation risk in the knowledge economy: Toward reputable action. *Organization Science*, *16*(3), 308–322. https://doi.org/10.1287/orsc.1050.0127

Sider, A., & Michaels, D. (2024, January 17). Judge blocks JetBlue's purchase of Spirit — Justice Department under Biden has taken tougher stand on airline mergers. *Wall Street Journal*. Retrieved from https://www.wsj.com/business/airlines/jetblue-spirit-airline-merger-blocked-4b2ba920

Sider, A., Maidenberg, M., & Keates, N. (2024, January 8). U.S. probes jet-door panel after blowout — Initial inquiry focuses on Alaska Airlines plane, not a broader problem with fleet. *Wall Street Journal*. Retrieved from https://www.wsj.com/public/resources/documents/KoC5pbkTXDXGWGchCrBG-WSJNewsPaper-1-8-2024.pdf

Tangel, A. (2024, January 29). Alaska Jet Likely Had Bolts Missing — Boeing, industry officials believe plane left factory without them on plug door. *Wall Street Journal*. Retrieved from https://www.wsj.com/business/airlines/signs-suggest-alaska-airlines-plane-lacked-bolts-when-it-left-boeing-factory-f0246654

Tangel, A., Sider, A., Terlep, S., & Keates, N. (2024, January 09). U.S. news: Airlines find loose parts on 737 MAX 9 jets — carriers are checking planes grounded by FAA after door-plug failure in midflight. *Wall Street Journal*. Retrieved from https://www.wsj.com/business/airlines/faa-approves-inspection-method-for-grounded-boeing-737-max-9-jets-c06c3234

Van der Meer, T., Kroon, A., Verhoeven, P., & Jonkman, J. (2019). Mediatization and the disproportionate attention to negative news: The case of airplane crashes. *Journalism Studies*, *20*(6), 783–803. https://doi.org/10.1080/1461670X.2018.1423632

Walker, T., Thiengtham, D., & Lin, M. (2005). On the performance of airlines and airplane manufacturers following aviation disasters. *Canadian Journal of Administrative Sciences*, *22*(1), 21–34. https://doi.org/10.1111/j.1936-4490.2005.tb00358.x

Walker, T., Walker, M., Thiengtham, D., & Pukthuanthong, K. (2014). The role of aviation laws and legal liability in aviation disasters: A financial market perspective. *International Review of Law and Economics*, *37*, 51–65. https://doi.org/10.1016/j.irle.2013.07.004

Wells, W. (2004). A beginner's guide to event studies. *Journal of Insurance Regulation*, *22*(4), 61–70.

Yang, L., Tjiptono, F., & Poon, W. (2018). Will you fly with this airline in the future? An empirical study of airline avoidance after accidents. *Journal of Travel & Tourism Marketing*, *35*(9), 1145–1159. https://doi.org/10.1080/10548408.2018.1476301

APPENDIX

COMMERCIAL AVIATION INDUSTRY: COMPANY NAME, TICKER SYMBOL, REVENUE, ASSETS, MARKET CAPITALIZATION, AND FIRM SIZE CATEGORY

Company name	Ticker Symbol	Revenue (billions)	Assets (billions)	Market capitalization (billions)	Firm size category
Aircraft Manufacturers					
Airbus	EADSY	$65.45	$118.87	$121.80	Large
Boeing	BA	$77.79	$137.01	$157.69	Large
Embraer	ERJ	$5.27	$10.78	$3.39	Small
GE Aerospace	GE	$67.95	$163.05	$138.91	Large
General Dynamics	GD	$42.27	$54.81	$70.86	Large
Honeywell International	HON	$36.66	$61.53	$138.25	Large
Lockheed Martin	LMT	$67.57	$52.46	$111.54	Large
Northrop Grumman	NOC	$39.29	$46.54	$70.59	Large
RTX	RTX	$68.92	$161.87	$120.99	Large
Spirit AeroSystems	SPR	$6.05	$6.95	$3.69	Small
	Mean	**$47.72**	**$81.39**	**$93.77**	
	Median	**$53.86**	**$58.17**	**$116.27**	
Airline Companies					
Alaska Airlines	ALK	$2.84	$15.17	$5.00	Small
Allegiant Air	ALGT	$2.51	$4.87	$1.52	Small
American Airlines	AAL	$52.79	$63.06	$8.98	Small
Delta Air Lines	DAL	$58.05	$73.64	$25.89	NA
Frontier Airlines	ULCC	$3.59	$4.99	$1.21	Small
JetBlue Airways	JBLU	$9.62	$13.85	$1.85	Small
Southwest Airlines	LUV	$26.09	$36.49	$17.22	NA
Spirit Airlines	SAVEQ	$5.362	$9.42	$1.79	Small
United Airlines	UAL	$53.72	$71.10	$13.53	NA
	Mean	**$23.84**	**$32.51**	**$8.55**	
	Median	**$9.62**	**$15.17**	**$5.00**	

Notes:
All data is reported as of December 31, 2023.
Alaska Airline's revenue and assets are reported as of September 30, 2023.
"Small" firm size category indicates a small firm with < $10B in market capitalization.
"Large" firm size category indicates a large firm with > $70B in market capitalization.