



# The Essence of Companies' Survival During COVID-19 Pandemic

## Case Study of Boeing

Ziyuan Gao<sup>1,†</sup> Xiaolong Liu<sup>2,†</sup> Haoxiang Qi<sup>3,\*†</sup>

<sup>1</sup> Kogod school of Business, American University, Washington DC, United States

<sup>2</sup> Earl Warren College, University of California San Diego, San Diego, United States

<sup>3</sup> Department of Economics, University of California Santa Barbara, Santa Barbara, United States

\*Corresponding author. Email: haoxiang\_qi@ucsb.edu

†These authors contributed equally.

### ABSTRACT

Contemporarily, the novel coronavirus continues to mutate, and the epidemic has recurred repeatedly. Boeing's economic trends were highlighted considering COVID-19's impact on the airline industry. We utilized financial accounting and BCG matrix to analyze the past operating, investing, and financing activities of Boeing. In addition to COVID-19, the impact of two previous 737MAX crashes on Boeing was also analysed. These negative factors have a lasting impact on Boeing. According to the change of Boeing's stock price as well as the change of Boeing's operations and assets in recent years, there is a certain downward trend. Besides, BCG Matrix is also used to analyse the data comparison between Boeing and their competitor Airbus. Airbus's trends are more stable than Boeing's, but the growth rate of Boeing is much higher. In addition, SWOT is also used to deeply analyse the advantages and disadvantages of Boeing. Boeing is still dealing with the fallout from the crash and a sharp decline in airline orders during the pandemic. However, Boeing has retained partnerships outside the aviation industry, allowing them to stay in business despite the continued downturn. Boeing's economy is expected to grow as tourism recovers. These results shed light on guiding further exploration focusing on the strategy of the Boeing.

**Keywords:** Boeing, COVID-19, Air crash, Airbus.

## 1. INTRODUCTION

It is now the third year of COVID-19 affecting the world. The world's major economies began to recover in 2022, thus reversing the economic downturn since 2020. However, from a macroeconomic perspective, the impact of COVID-19 on economic development is long-term in nature. According to research, the epidemic has had a huge impact on human beings. Since the outbreak of COVID-19, many small companies have faced the threat of bankruptcy. This has resulted in a straight-line increase in unemployment [1]. The epidemic has set back the development of society and caused economic depression. In 2020, the median global output loss was 6.5%. Although this trend narrows to 4% in 2021, the economic losses are highly dispersed across the major economies [2]. The overall economic trend won't pick up until 2022, but some industries, are still depressed, such as aviation.

Affected by the outbreak, many regions have implemented policies to reduce the travel. As a result, the overall economy of tourism in 2020 has declined. According to Katy's survey, 36% of tourists have reduced their flight plans, an increase of 5% over the previous proportion [3]. The decline in tourism has also hit airline revenues hard. Airlines' revenues are now down by about 60%, based on data before 2020. Moreover, the airline industry is linked to many other industries. In addition to losses on passenger flights, air transport, airports and aircraft manufacturing will be severely affected. Since 2020, the freight of aviation has decreased by more than 30%, and the number of flights has decreased by about 40% compared with 2019 [4]. The decline in customer demand for the airline industry may not return to 2019 levels after 2022.

James and his team analysed the global economic situation under the epidemic situation in 2020 from the perspective of macroeconomics. Gross domestic product

(GDP) will fall in all countries in 2020 due to severe labour and supply shortages. The world's developed economies are expected to remain less than 60% of output by 2024 [5]. Shohini analysed data on the impact of COVID-19 on various sectors, including tourism, aviation, oil, healthcare, and finance. Every country's economic situation has declined under the impact of the pandemic. The economic losses within the industry also led to the increase of unemployment rate [6]. Besides, Sharon analysed the impact of the pandemic on businesses, as well as changes in the supply chain. In the context of demand, supply, and investment shortages, Sharon focused on the response of businesses to the pandemic and the impact on the private sector, businesses, and employees [7]. Small businesses, among others, have been hit harder. Alexander surveyed more than 5,000 small businesses, focusing on how small businesses are coping with the current pandemic. Based on the analysis, Alexander also mentioned the corresponding decisions made by the government and the forecast of the future development of small enterprises [8]. Robert also analysed small businesses. In contrast, Robert analysed the activity of small businesses and included the analysis of business activity of different groups. Since 2020, the overall activity of small enterprises has decreased by 22%, and all groups of enterprises have suffered serious losses in their business activities [9].

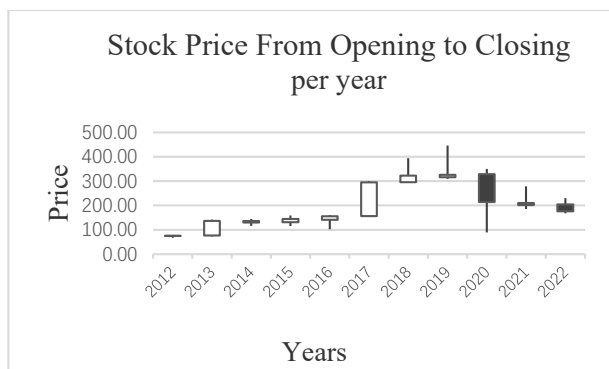
On the other hand, Aaron and Ember chose to look at the impact of the pandemic on workers in different regions from the ground up. They see unemployment rising more in cities that rely on manufacturing in 2020. They also offer some valuable suggestions for solving the problem of declining labour forces in some parts of the country [10]. Marinko, Domingo and Magorzata analyse the development of tourism in the context of the pandemic. They believe it could take more than 10 months for global tourism to recover to previous levels. According to the analysis, PSVAR is used to evaluate the financial cycle of tourism industry [11]. Elizabeth, Shubham and Sicheng analysed the transportation industry under the epidemic. The transport industry is still suffering from a lot of workers being laid off because of reduced demand. Transportation workers are 20.6% more likely to be laid off than workers in other industries. In the next few years, the transportation industry may need to prepare for the possibility of disruption of the industrial chain [12]. Jaap investigated the airline industry in the pandemic. Most parts of the airline industry will see big losses in 2020, except for freight companies. During the pandemic, NPV of airline companies decreased by 11% [13]. Sandro also analysed the airline industry during the pandemic, but his core focus was on the industry's liquidity. According to actual EU figures, the number of flights in 2020 decreased by more than 89%. It is expected that the number of flights will be further reduced by 11%-25% in the next year or two [14].

In this passage, Boeing as an example to examine how capital outflow happens in the aviation industry which highly depends on globalization under the COVID-19 Pandemic. This study also serves as a reference for other global companies affected by the pandemic to adjust their corporate strategies and management.

## 2. COMPANY PROFILE

Boeing is the world's largest aerospace company, and Boeing is one of the largest manufacturing exporters in the United States, which provides both civilian and military airline support services [15]. Boeing is also a major supplier to National Aeronautics and Space Administration (NASA), which possesses a very broad footprint in the aerospace industry. Boeing has three main business units: Commercial Aircraft; Defense, Space and Security; and Global Services. From manufacturing to services, it also occupies a key position in the entire aerospace industry chain in the United States, and more than 12,000 companies are working with Boeing. Boeing's main office is located in Chicago, whose subsidiaries operate in more than 65 countries with more than 140,000 employees. As a huge enterprise, Boeing has faced many serious business challenges and problems during their decades of operation. The most memorable was the grounding of the Boeing 737 MAX. The two air crashes caused a huge stir at the time. These two air crashes were in the coast of Indonesia in October 2018 and the Ethiopia in March 2019, A total of 346 people were killed in the two air crashes, according to the investigation [16]. Boeing faces more than 150 lawsuits brought by victims' families. It replaced their CEO to deal with internal management problems. Boeing paid a heavy price in both incidents. In the airline industry, the impact of a crash is lasting.

Boeing has been trying to fulfill its own goals, but in the long-term operation, it will inevitably face some financial and economic problems that need to be solved. From the stock market development of Boeing company in the past few years, the development of Boeing is not very stable, which should be due to the negative impact of several aircraft accidents. After the outbreak, the development of the aviation industry was seriously affected. Obviously (as shown in Fig. 1), the epidemic in 2020 affected Boeing significantly, one of the giants in the aviation market, and Boeing's stock price fell sharply in 2020, with a big difference between the highest and lowest stock price changes. Boeing's lowest price was less than \$100. Although there was a brief recovery, but until 20222 this year, Boeing shares still maintained a downward trend. Based on current international trends, Boeing's stock market is likely to remain depressed for the next year or two.



**Figure 1** Boeing's stock market opening price to closing price of the past ten years. The trend of a stock includes a high price and a low price.

### 3. FINANCIAL ANALYSIS

Boeing is a microcosm of most publicly traded companies during the pandemic, which suffered from operating issues and liquidity crises. As most countries and regions had issued cross-border travel restrictions after the outbreak of COVID-19 transmission in Wuhan, the airline industry suffered in the first place. Even though the pandemic will eventually be over, its effect on the air travel industry to some extent is long-lasting. Researchers in McKinsey compare the current situation with the decline and rebound of business travel after 9/11 and the global financial crisis to reach a conclusion. From the study conducted by McKinsey, even though they predict that leisure trips will fuel the recovery of air travel, a big portion of airlines' ticket revenue, income from business travel, will need a longer time to return to the

pre-pandemic levels. In our view, such a rebound should take a longer period, or in an extreme case, it may not happen in the predictable future. Unlike 9/11, the pandemic not only hurt the overall economy but also altered people's way of life and work. As online activity was becoming more frequent and the market shifted to the internet, the notion "Work from home" was widely promoted by most leading firms in their respective industries. This phenomenon leads to business travel being a non-necessity for many executives and staff. Such a change in working style may be enduring, which will further lead to a leftward shift of the aggregate demand curve of business travel, and the effect is self-evidently disastrous for the airline companies. In the study, researchers show that the debt of the airline industry could be greater than its revenue by 2024. Financial woe on the downstream firms, airline companies, has imposed an observable negative effect on Boeing after the pandemic, since the potential liquidity challenges faced by airlines would force them to cut the orders with Boeing, as part of their plan for a future strategic shift. Therefore, as the steady cash flows from aircraft orders have faced tremendous challenges, its cash and cash equivalent numbers have experienced a sharp decline after the pandemic as given in the Table. 1 and 2, i.e., from 9485 to 7752 (in millions, shown in Table.1). The decline in cash holdings can be further exacerbated by decline in its stock price, since investors lowered their expectation on the future revenue of Boeing, which decreases the cash that Boeing can obtain from financing activities by the logic of CAPM and semi-strong form of Efficient Market Hypothesis.

**Table 1.** Financial overview.

U.S. dollars in millions, except per share data	2020	2019	2018	2017	2016
Revenues	58158	76559	101127	94005	93496
(Loss)/earnings from operations	-12767	-1975	11987	10344	6527
Diluted (loss)/earnings per share	-2088	-1.12	17.85	13.85	7.83
Operating margins	-22.00%	-2.60%	11.90%	11.00%	7.00%
Core operating (loss)/earnings	-14150	-3390	10660	8.906	5170
Core operating margins	-24.30%	-4.40%	10.50%	9.50%	5.50%
Core (loss) /earnings per share	-23.25	-3.47	16.01	12.33	6.94
Operating Cash flow	-18410	-2446	15322	13346	10496
Contractual backlog	339309	436473	462070	456984	458277
Total backlog	363404	463403	490481	474640	473492

**Table 2.** Current Asset portion from Boeing's Consolidated Statement of Financial Positions (2019 vs. 2020)

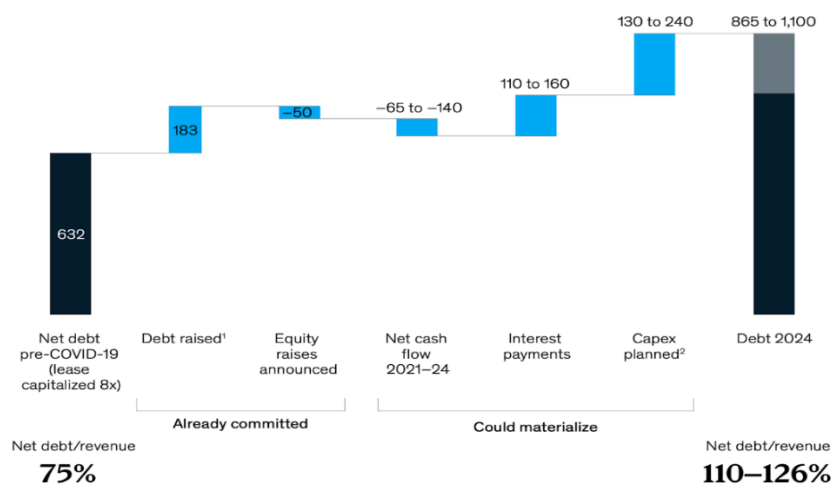
The Boeing Company and Subsidiaries (Dollars in millions, except per share data)		
December 31,	2020	2019
Asset		
Cash and Cash equivalents	7752	9485
Short-term and other investments	17838	545
Account receivable, net	1955	3266
Unbilled receivables, net	7995	9043
Current portion of customer financing, net	101	162
Inventories	81715	76622
Other current assets, net	4286	3106
Total current assets	121642	102229

Besides the effect of COVID-19, Boeing already faced a safety crisis caused by the two crashes of Boeing 737 Max, the crash of Lion Air Flight 610 in 2018 (189 casualties) and the crash of Ethiopian Airlines in the following year (157 casualties). Fig. 3 and 4 give the financial descriptions of Boeing and orders of Boeing 737, respectively. Technically speaking, the real villain of the catastrophes is the malfunction of the Maneuvering Characteristics Augmentation System (MCAS) of the 737 MAX aircraft. However, merely fixing that widely blamed system cannot save Boeing from the already triggered crisis. The occurrence of the two incidents in such a short period of time has caused a great deal of safety concern among the general public. Even though according to the United States National Transportation Safety Board's calculation, an aviation disaster happens every 16.3 million flight hours, some people still have strong concerns on flight safety, just as Khneman and

Tversky suggested that people overweight small probabilities. Such overweighting on probability of air crashes should be further aggrandized by the consecutive occurrence of two incidents, making travelers less willing to travel by air, especially by the 737-MAX model. Without the intervention of authorities, the decreased demand would already generate huge losses for airline companies. More than the market demand logic, the occurrence of safety issues forced the government and related agencies involved. Following the Federal Administration Agency and Civil Aviation Administration of China's grounding order, authorities worldwide grounded 737 max aircraft for about two years. During that time period, Boeing faced countless financial and legal issues, including the cancellation of 737-max orders and lawsuits by airline companies for their financial loss due to the grounding.

**Unless measures are taken, industry debt could exceed revenue by 2024.**

**Airline industry financing need and net debt, \$ billion**



**Figure 2** Airline Industry financial need and debt.

Boeing 737 gross orders from 2004 to 2020

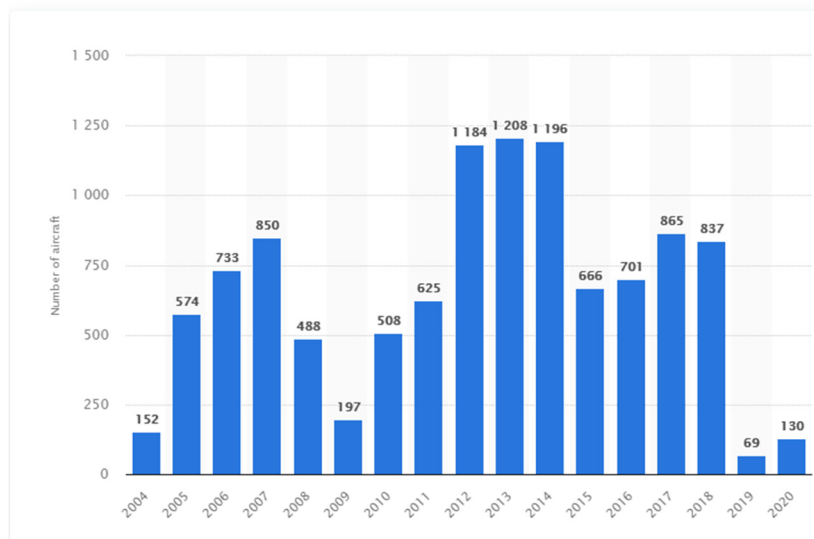


Figure 3 Gross Order from 2004 to 2020.

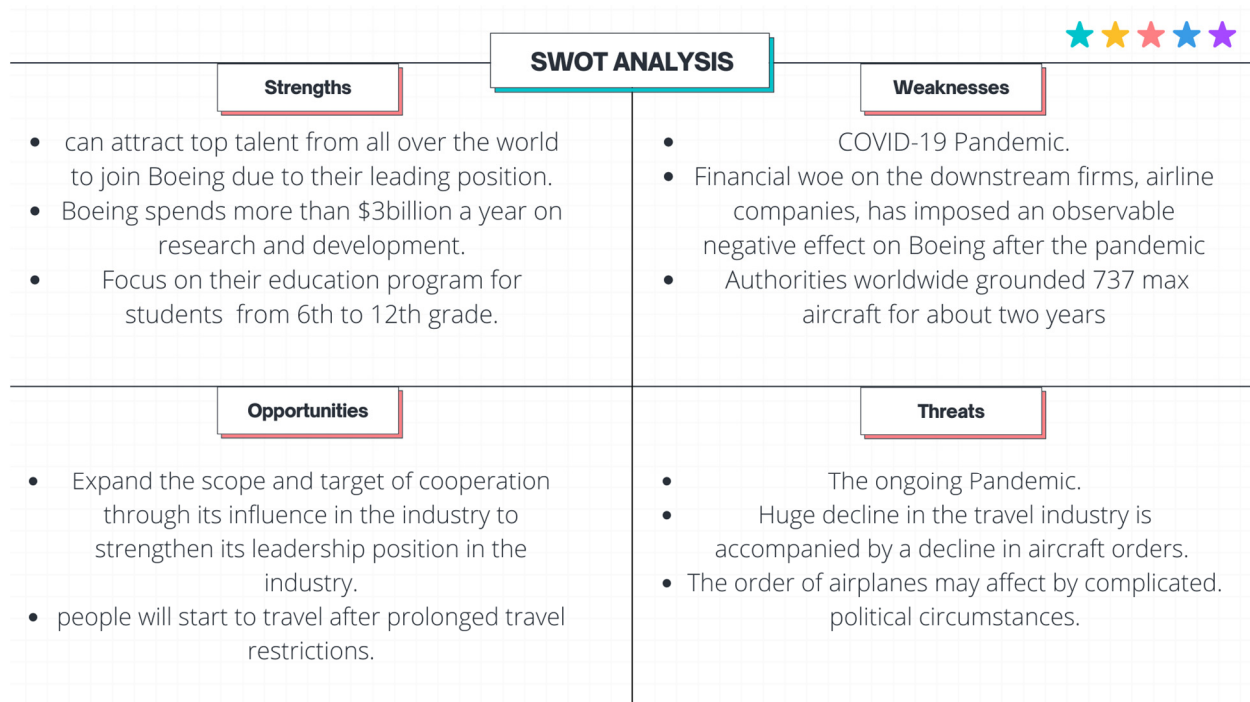
4. BCG MATRIX & SWOT

By the Boston Consulting Group, Boeing is now part of Question Mark. Its market share in 2020 and 2021 is summarized in Table. 3 that of its main competitor, Airbus. Fortunately, they are growing faster than Airbus

and the growth rate is accelerating. They had only 184 orders in 2020 but 909 orders in 2021. This growth is very rapid. Airbus increased its orders by just 1% compared with last year, while Boeing increased its orders by 294%. In addition, Boeing has seen rapid growth in order deliveries, up 17% compared with last year, compared with 8% for Airbus

Table 3. Boeing vs. Airbus on Deliveries & Gross Orders

Boeing	Airbus
<b>Deliveries</b>	<b>Deliveries</b>
2020: 157	2020: 566
2021: 340	2021: 611
%of change: 117%	% of change: 8%
<b>Gross Orders</b>	<b>Gross Orders</b>
2020: 184	2020: 383
2021: 909	2021: 771
% of change: 394%	% of change: 101%



**Figure 4** SWOT analysis.

The SWOT analysis for Boeing is presented in Fig. 4. As for strengths, Boeing is the world's largest manufacturer of Airplanes, Rotorcraft, Rockets, Satellites, Telecommunications Equipment, and missiles worldwide. On account of Boeing's leading position in the industry, they can attract top talent from all over the world to join Boeing. Diverse teams from around the world will also bring more innovation and vitality to Boeing. Meanwhile, they also have an education program for students called future. They partnered with Discovery Education to create a program to inspire innovation and invention for students from 6th grade to 12th grade. In addition, Boeing spends more than \$3billion a year on research and development, which is a key reason why they maintain an edge in the industry. For instance, their Eco Demonstrator uses big data to manage their aircraft more effectively to save energy and protect the environment. According to our previous BCG Matrix, the rapidly growing market share is also Boeing's advantage. Although the overall market share does not exceed its biggest competitor Airbus, the growth rate far higher than Airbus ensures Boeing's position and advantage in the subsequent market competition. These are Boeing's strengths.

Regarding to weaknesses, the COVID-19 pandemic is one of Boeing's current difficulties. Financial woe on the downstream firms, airline companies, has imposed an observable negative effect on Boeing after the pandemic, since the potential liquidity challenges faced by airlines would force them to cut the orders with Boeing, as part of their plan for a future strategic shift. Besides the effect of COVID-19, Boeing already faced a safety crisis caused by the two crashes of Boeing 737 Max, the crash

of Lion Air Flight 610 in 2018 (189 casualties), and the crash of Ethiopian Airlines in the following year (157 casualties). Following the Federal Administration Agency and Civil Aviation Administration of China's grounding order, authorities worldwide grounded 737 max aircraft for about two years. During that period, Boeing faced countless financial and legal issues, including the cancellation of 737-max orders and lawsuits by airline companies for their financial loss due to the grounding.

For opportunities, the pandemic has led to a decline in the travel industry. Nevertheless, when the pandemic is about to end, people will start to travel because of prolonged travel restrictions. This is an opportunity for both the travel industry and Boeing. Boeing's orders will grow as the travel industry revises. Another opportunity for Boeing is to actively seek more cooperation, i.e., expand the scope and target of cooperation through its influence in the industry to strengthen its leadership position in the industry

With regard to threats, ongoing Pandemic is one of Boeing's biggest threats, a huge decline in the travel industry is accompanied by a decline in aircraft orders. Politics is also a threat to Boeing. In complicated political circumstances, some countries (e.g., China), are increasingly seeking to buy planes from Boeing's competitor, Airbus. Complicated political circumstances could also threaten Boeing. Although Boeing's market share is growing very fast, Airbus still has more market share than Boeing. And politics is likely to drive a buyer or potential buyer of Boeing to buy a rival aircraft. That would cause Boeing to lose its rapid growth rate.

## 5. DISCUSSION

Taking the two variables (the pandemic and 737 incidents) together into consideration, both the pandemic and Boeing's own safety issue resulted in its tragedy in the 2020s. Unfortunately, the effects of both factors are long-lasting. Although people already saw the recertification of 737max by FAA, CAAC & other authorities, their concerns toward 737 max (and potentially toward other Boeing models) still existed, as the trauma from watching the air crash took a long period to heal. Though most people have a positive prediction on the development of the pandemic after viewing the continued improvement of COVID-19 transmission, as stated before, the loss in revenue due to permanent change in people's way of life will persist to almost every fiscal year in the future. Therefore, based on the above analysis, we make the prediction that Boeing's revenue will steadily decrease from 5.1% in 2021 to 2.6% in 2025.

## 6. CONCLUSION

To sum up, the pandemic is a relocation of wealth. For the aviation industry, such a relocation of wealth is presented as capital outflow. Therefore, Boeing, as the primary representative of the aviation industry, suffered from financial crisis from the progression of the pandemic, as policies such as travel restrictions and concerns about the virus have depressed the airline industry. Moreover, such a crisis was further aggrandized by its 737-MAX safety issue. Additionally, its competitor, Airbus, is very strong in some of the key fields. Although Boeing's growth rate is much higher than Airbus's, it still possesses the largest market share. In a complicated political environment, Boeing's orders are vulnerable and could be diverted to Airbus. However, Boeing also has opportunities and advantages. Fortunately, Boeing has plans for the future. For instance, Boeing's educational projects in cooperation with educational institutions, the high annual research funding of than \$3billion and their rapidly growing market share and so on. This advantage will also enable Boeing to recover quickly and even better than its historical performance when the pandemic eases in the future. Overall, these results offer a guideline for investment decision and strategy designs for Boeing. However, more financial and commercial information on Boeing's competitor Airbus would help us establish a more solid point on the aviation industry. Also, due to limited sources, we didn't incorporate a detailed account of Boeing's future strategic plan. Therefore, further work need to be done to include more firms in the industry and more information on firms' future business plan to build up a more comprehensive picture on the situation faced by aviation industry during the pandemic. Since the market is everchanging, the future study should be conducted on a yearly basis.

## AUTHORS' CONTRIBUTIONS

These authors contributed equally.

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