

Post-Pandemic Risk Management Strategies in the Aviation Industry: case study of HNA Group & Aegean Airlines

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Abstract. As the global economy gradually recovers from the impact of COVID-19, the aviation industry is also ushering in long-awaited development opportunities. However, the challenges facing the post-pandemic aviation industry should not be ignored, including increased market competition, an uncertain global economic environment, frequent policy adjustments, regional conflicts, and external risks. This study analyzed the risk management practices of Hainan Airlines Group and Aegean Airlines, among other typical cases, to explore how airlines can strengthen risk management during the post-pandemic recovery period. This study analyzed the risks faced by airlines during the recovery process and their causes from multiple dimensions, such as market demand forecasting, cost control, operational efficiency improvement, external environment analysis, and safety management, and put forward corresponding management suggestions and strategies. Through systematic analysis and research, this study aims to provide a useful reference for airlines' risk management in the post-epidemic era and help airlines achieve stability and sustainable development in a complex and ever-changing market environment.

1 Introduction

As the global economy gradually gets rid of the shackles of COVID-19 and shows a strong recovery trend, the aviation industry, as an indispensable artery of the global economy, has also ushered in the long-awaited spring. However, the challenges facing the aviation industry in this particular post-pandemic era cannot be ignored. Although the rapid recovery of market demand has brought growth opportunities, it has also intensified the intensity of market competition and put forward higher requirements for internal factors such as the operating efficiency and service quality of airlines. In addition, uncertainties in the global economic environment, frequent policy adjustments, regional conflicts, local hot wars, trade blockades,

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and other external factors have brought many risks to the operation of the aviation industry. This suggests that risk management systems are particularly important.

To analyze this complex and changeable industry environment, this paper selects HNA Group as a typical case for analysis, whose risk management practices provide valuable lessons for the entire industry. At the same time, combined with the characteristics of the current industry recovery period, this study will further explore how airlines can strengthen risk management in the post-epidemic era. Starting from multiple dimensions such as market demand forecast, cost control, operation efficiency improvement, the current situation of the external environment, and strengthening of safety management, we will deeply analyze the risks faced by airlines in the recovery process and their causes and put forward corresponding management suggestions and strategies. Through systematic analysis and research, this study aims to provide useful reference and reference for the risk management of airlines in the post-epidemic era and help airlines achieve stable and sustainable development in the complex and changeable market environment.

2 Airline reorganization: case of HNA

Founded in 1993, HNA Group became China's first private aviation enterprise through shareholding reform and ranked 170th among the world's top 500 enterprises in 2017, with total assets of more than one trillion yuan. The detailed measures taken by HNA Group in the face of major risks are outstanding. SARS in 2003, which is very similar to the COVID-19 epidemic, had a huge impact on the aviation industry. The senior management of HNA began to shift from a single industry to a diversified development direction, proposing a strategy of "one main and two wings" and vigorously developing related tourism, hotel industry, and financial business while taking the main business of aviation. HNA Group completed a total of eight industrial fields of aviation, tourism, commerce, logistics, finance, airport management, real estate, and green food, which is far more than other private aviation enterprises in the same period. When the financial crisis hit in 2008, HNA's development strategy began to shift from diversification to internationalization, and it began to invest and buy overseas companies. Take the combination of air and travel as an example. In 2016, HNA established HNA-CAISSA, which increased its market value from 1.7 billion to 22 billion Yuan. Relying on the advantages of high barriers in the aviation industry, HNA carried out the model of combining tourism and aviation, which produced great interaction and mutual promotion effects. And in each response to risks and crises, HNA's excellent performance, there is also an adjustable crisis. When HNA Group was faced with SARS and the subprime crisis, it was faced with the risk event of substantial default. In 2003, HNA reported an annual loss of 14.74 trillion yuan, which was largely solved by the capital injection of 10 trillion yuan from the Hainan Provincial government. After the subprime crisis occurred in 2007, HNA Holdings began to purchase many non-performing assets in the subprime crisis at low prices and, at the same time, made overseas market layouts. Shareholding or controlling of Swissport, Hilton Hotels, Deutsche Bank, etc. According to the credit risk data and research of the aviation industry under the COVID-19 epidemic, among the A-share listed companies in the aviation industry, according to the calculation of KMV and ZPP models, the default probability of HNA Holding has increased year by year, and the default rate is the highest or at the forefront. We can see that in the face of the previous risks and crises, HNA Group's risk control and cognition were not in place. Before the outbreak of the epidemic, its debt level far exceeded the scope of real economy enterprises, and its leverage ratio was comparable to that of financial enterprises. Therefore, the credit risk was constantly amplified by the epidemic and finally led to the collapse of the HNA Group [1].

In the post-epidemic era, flight attendants of Hainan Airlines began to remove masks and face passengers on May 6, 2024, becoming the first in China. When dealing with policies and special realistic conditions, HNA's approach not only follows the theme of the service industry taking service as the first element but also declares the retreat of the epidemic by practice and makes a positive example for the social impact. By 2024, HNA has won the "SKYTRAX Five-Star Airline" for the 13th time in a row and won three global or regional first awards of "Best Airline in China, Best Airline Staff Service in China, and Best Business Class Comfort products in the world." Skytrax, the world's leading airline and airport service evaluation organization, its awards represent the highest honor in the aviation industry. As the first and only SKYTRAX five-star airline in the Chinese mainland, HNA's high-quality service and quality products have provided HNA with a large number of customers with high viscosity, which has played a crucial part in HNA's recovery efforts after this outbreak.

HNA bankruptcy reorganization case, as the largest, most complex, and most difficult reorganization case in China so far, can maintain good use after bankruptcy reorganization, which brings us rich experience and lessons. First, the air transport industry is easily affected by external conditions, some natural disasters, financial crises, geopolitics, trade disputes, and other risk events will have an impact on the aviation industry. The diversified and international development strategy advocated by HNA promotes some air transport enterprises with relatively single-asset structures and production fields, opens more cooperation areas to the outside world, and optimizes the industrial structure to enhance the ability to resist risks. Second: For the asset-heavy, high-barrier aviation industry, it is necessary to actively interpret current affairs and policies to enhance their vertical fields. Hna provides quality services to passengers with the concept of service first, and while maintaining the high viscosity of customers, it also vigorously seized the originally small market share. Three: The HNA restructuring case is a major update to China's bankruptcy reorganization system, providing a path for enterprises in trouble to get out of debt and enhance the ability of enterprises to resist risks. It also warns us that risk control is necessary for long-term strategic planning [2]. The above are some of the practices of HNA Group in the risk events such as the epidemic. The experience and lessons it brings to us in the field of risk management can be extended to the aviation industry as a reference.

3 Airline operation

The aviation industry is also an important part of the aviation industry. Manufacturers led by Boeing and Airbus stopped production of wide-body aircraft such as 777 and A380 during the epidemic period and turned to increased production of narrow-body aircraft. Wide-body aircraft operating hub-and-radiation route networks are no longer popular, the recovery of international aviation is still uncertain, and the recovery of domestic air travel and rising fuel prices have magnified the advantages of narrow-body aircraft [3]. Secondly, the customer changes goods. Shandong Taikoo Maintenance factory is Boeing's largest "passenger to cargo" service provider in the world, orders have been scheduled for three years later while major airlines and airports change routes and increase cargo efforts, this practice is expected to revitalize the airline's huge assets, in exchange for precious cash flow [4]. The tightening strategy. Aegean Airlines takes advantage of horizontal human resource management programs promoted by the Greek government, such as remote working and the recruitment of part-time employees [5].

There are still a few things we need to look at about the current situation in the airline industry. The global situation is currently characterized by local hot wars and frequent regional conflicts, which will lead to the closure of national airspace to each other. For example, Lufthansa suspended flights from Frankfurt to Beijing because the conflict between Russia and Ukraine caused Russia to close its airspace to some European airlines. From May

2024, airlines from the United Kingdom, Australia, and other countries stopped direct flights to Beijing, and in October, many countries in the Middle East closed their airspace. This is not uncommon in history, since the 1950s, the most significant air space closure incidents include Pakistan's closure of air space to India in 1952; Spain's exclusion zone over Gibraltar in 1969 sparked a dispute with Britain; India closing its airspace to Pakistan in 1971; The closure of United States airspace to Cuba (from the 1960s until the early 1990s); European countries closed their airspace in 2010 because of a volcanic eruption in Iceland; In 2017, Bahrain and other countries closed their airspace to Qatar; Pakistan closed its airspace to India in 2019; In 2022, Europe, the United States, and Russia closed their airspace to each other. All but one of these events were caused by natural causes, but all were caused by geopolitics. The closure of airspace has a significant impact on the aviation industry, and in addition to financial losses, it can also lead to incidents such as the KAL007 crash in 1987 and the MH17 crash in 2014. The closure of airspace has become a kind of sanction and counter-sanction. Because of the airline industry's distinctly diplomatic nature, geopolitical and local conflicts sometimes creep into the air transport industry. In their risk operation management, airlines often rely on judicial and diplomatic solutions at the level of national sovereignty, and their behavioural capacity is weak. For example, after the mutual closure of airspace between Russia, Europe, and the United States in 2022, Finnish Airlines was almost bankrupt, and its biggest economic loss was flying almost completely around the largest country on earth - Russia. In this case, such airlines should now broaden their route networks and adjust their flight and capacity planning while actively researching routes between origin and destination to ensure that they can remain operational in the event of a disruption. In the highly developed air transport industry, airlines should also attach great importance to the dispute resolution mechanism of the International Civil Aviation Organization, actively make use of the compulsory jurisdiction mechanism of the International Civil Aviation Organization, and strive to provide legal settlement channels for disputes caused by airspace closure [6].

4 Aviation accident risk management

In addition, in the process of risk management in the aviation industry, safety is its first lifeline. The MU5735 crash in 2022 was the most recent aviation accident. In terms of short-term impact, the stock price of Boeing Co., the manufacturer of the 737 aircraft that was killed, fluctuated sharply on the same day, and the stock price of China's domestic aviation industry sector continued to be depressed, including China Eastern Airlines (600115. SH) as of March 25 closed down 13.88%, in addition, airport listed companies were also affected. For example, Baiyun Airport (600004. SH), which was still rising before March 21, fell by 8.18% on March 25, and Shanghai Airport's (600009. SH) cumulative decline reached 7.4%. In the long run, the impact of air disasters on the civil aviation industry is huge, including market confidence, disaster costs, and other losses. In the post-epidemic era, the industry is still in the recovery period, and aviation enterprises lack tolerance for accidents, especially in the turbulent period of poor management and a bad market environment, which is necessary for the prevention and control of major accidents. The Lockerbie air crash and TWA800 crash devastated the 20th-century American aviation giants Pan Am and TWA, and the Yichun air crash also caused the bankruptcy of Roc Airlines, the Ethiopian Air crash, and the Indonesian Lion Air disaster once grounded Boeing's star product 737 MAX. It is worth mentioning that investigations into two Boeing 737 MAX plane crashes have identified MACS with fatal design defects as the direct cause of both crashes. So, these two crashes are classic examples of failed human-automated interactions. According to the research, from the top-level structure of the FLAP model, the operator/airline node is only affected by the regulatory body and will have an impact on training and manufacturers. But in the case of

the two 737 MAX crashes, the operator/airline influence path to the manufacturer needs to be modified to some extent, which is exactly what Boeing persuaded the two airlines to abandon simulator training because it would increase the cost of operating the company. Perhaps because of Boeing's long-standing safety credentials and the FAA's endorsement, the two airlines did not operate the 737 MAX without adhering to simulation training. It can be seen that Ethiopian Airlines and Indonesia's Lion Air will not pay attention to safety in their management systems but rely on the so-called reputation of Boeing, which is a big taboo in the risk management system [7]. Also, in risk management, in addition to the monitoring of machinery, there is control over the behavior of relevant personnel. For specific personnel to develop reasonable and appropriate management rules and regulations. As for pilot fatigue monitoring, according to the National Aeronautics and Space Administration statistics, 21% of flight accidents are related to pilot fatigue. There is a study suggesting that fatigue is a multidimensional construct connected to psychological and physiological factors. Both of these factors must be considered and carefully examined if the high level of aviation safety is to be maintained, especially in times of significant disruptions that threaten the efficacy of well-established risk management systems. This encourages airlines to have a comprehensive database of risk factors and to have methods and instruments to ensure that fatigue levels are measured [8].

The prevention and treatment of air accidents is the most important chapter in the risk management of the aviation industry, which reminds airlines to protect the bottom line of safety in difficult times, not to reduce investment in safety for the sake of interests and efficiency, and to improve and strengthen the safety and security regulations system and accident emergency treatment plan of the airline. At the same time, timely and full attention should be paid to the subsequent accident investigation and accident compensation. For example, Malaysia Airlines was also hit hard by the two major accidents of MH370 and MH17, but its active compensation and open accident treatment, as well as the company's subsequent public relations and operational rectification, made it understood by all parties afterward. The regulations on risk operation management of airlines should also attach importance to the aviation accident damage compensation system, whose implementation is a compensatory way to reduce losses after the event. The long-term construction of the aviation accident damage compensation system has become one of the important measures to protect the overseas safety interests of citizens and the reputation of airlines [9]. There was a study that showed that during the COVID-19 pandemic, consumers react more favorably to safety as compared to emotional advertising appeals. More specifically, participants indicated higher air travel intentions and higher intentions to recommend the airline when they were exposed to safety appeals as compared to emotional appeals. Therefore, a reliable risk management system can win the reputation of consumers from the side and drive the positive development of the company [10].

5 Conclusion

This study takes an in-depth look at the diverse responses airlines have taken during the pandemic and reveals how they have managed to survive and thrive in a challenging market environment. Through the analysis, we found that the airline not only effectively alleviated the operating pressure but also successfully activated the market demand through flexible and innovative practices. More importantly, this study emphasizes the importance of policy support and international organizations. Government support measures provide critical financial support and market confidence for airlines, while the rules and regulations of international organizations help to resolve the thorny issues and disputes of airlines. At the same time, airlines should also place safety at the top of their risk management system. To sum up, although the epidemic has had an unprecedented impact on the aviation industry,

airlines have successfully responded to the crisis with their keen market insight, rapid resilience, and continuous spirit of innovation, and laid a solid foundation for future sustainable development. The aviation industry has a strong externality, and some risk events will have an impact on the aviation industry. Its risk management is essentially a constant struggle against “vulnerability” so that it can have more reasonable and calm coping strategies and development plans in the face of future situations such as the novel coronavirus epidemic. This study provides an important reference for understanding the response strategy of the aviation industry during the outbreak and also provides a useful reference for other industries when facing similar challenges.

Authors Contribution

All the authors contributed equally, and their names were listed in alphabetical order.

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