

# Research on Airline Financial Analysis Based on BSC—Taking China Eastern Airlines Group as an Example

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**Abstract:** As China's economy continues to develop at a high quality and the quality of life of its citizens continues to improve, aviation is becoming a mode of transportation for more people to travel. From the beginning of 2023, with the strong recovery of domestic mobility and consumption, China's civil aviation capacity has gradually recovered, and the airlines' financial situation has continued to improve, ushering in a rare development opportunity. In this context, this paper takes China Eastern Airlines as the research object, uses the BSC balanced scorecard to deeply analyze the financial status, internal operation, employee growth and other aspects in the past five years and conducts research, through the research and analysis, it is found that China Eastern Airlines Group currently exists in the fluctuation of oil prices and exchange rates, the shrinkage of the passenger source, the competition in the same industry and the shortage of high-end research and development talents. China Eastern Airlines Group can take measures to solve the risks and problems by diversifying and reducing the risk of liabilities, optimizing the route network, optimizing the route network and guaranteeing the price of liquid assets and the stability of the fuel supply chain through multiple channels.

**Keywords:** Balanced Scorecard, Financial Analysis, Airlines

## 1. Introduction

Since the 13th Five-Year Plan, the Chinese government has attached great importance to the construction and development of transportation, and has successively formulated the Outline for the Construction of a Strong Transportation State, the Outline for the Planning of a National Comprehensive Three-Dimensional Transportation Network and other guiding documents, which propose to build a clear and smooth national airway and route network, and to build an air transportation powerhouse by 2035.

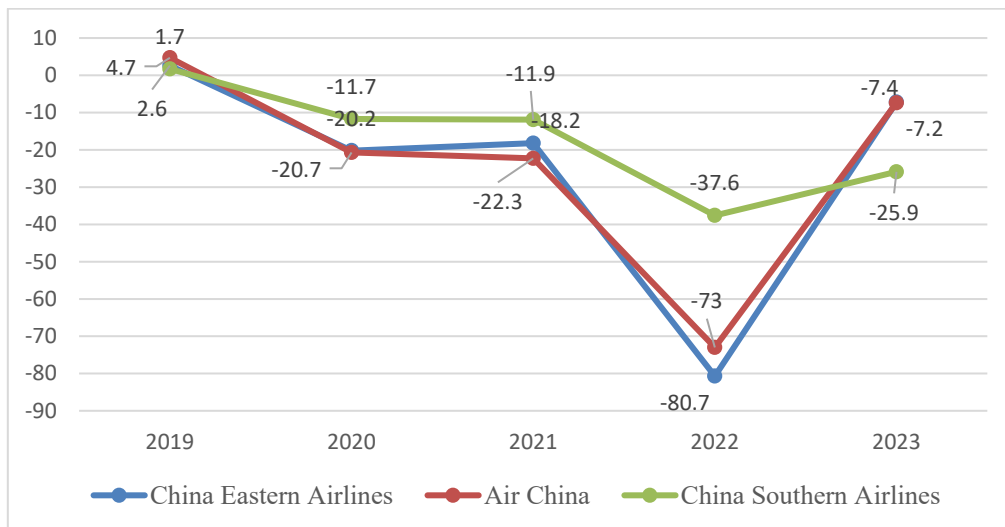
China's civil aviation business has also ushered in a rare opportunity for development in 2023, with China's major airlines making significant achievements in the market recovery, with the revenue of the three major domestic backbone airlines growing, and the total revenue of Air China, China Southern Airlines and China Eastern Airlines amounting to RMB 414,770 million in 2023, basically recovering to the level of 2019, and the volume of domestic civil aviation passenger traffic growing by 30.4%, which has already recovered and surpassed the level of development in 2019.2019 levels of growth. However, due to the complexity of the market environment, the airlines' capacity has not fully recovered and the task of turning around losses remains daunting.<sup>[1]</sup>

Taking China Eastern Airlines as a case study, this paper uses the BSC balanced scorecard to analyze and study in-depth the financial reports of China Eastern Airlines Group for the past five years and to understand the development of China Eastern Airlines Group, and assesses the current performance situation in detail from the four dimensions of finance, customer, internal operation and learning and growth. Combined with financial knowledge and the current market environment, the study explores the performance problems and risks of China Eastern Airlines Group in the process of turning its performance into profitability, and puts forward the corresponding suggestions and countermeasures from the perspective of the accounting profession, so as to provide reference suggestions for China Eastern Airlines Group's enterprise economic development and performance planning, and to contribute to the financial wisdom for the promotion of the sustained and healthy development of China's civil aviation industry.

## 2. Analysis of the performance of China Eastern Airlines Group and favorable conditions for future development

### 2.1. Financial aspects - Strong recovery after the downturn

Founded in 1988, China Eastern Airlines is headquartered and based in Shanghai, the most internationalized city in China. As an enterprise directly under the central government of China and one of the three major backbone airlines in the country, as well as a major member of SkyTeam, one of the world's three largest airline alliances, China Eastern Airlines has been ranked among the top domestic and international airlines in terms of revenue and assets for a long period of time. Its revenue and total assets have long ranked among the top domestic and international airlines. Over the past five years, China Eastern Airlines has experienced a sharp financial decline in 2020 and a strong recovery in 2023. In terms of profitability, according to Figure 1 can be seen in 2020 China Eastern Airlines Group net interest rate from 2.6% in 2019 fell sharply to -20.2%, to 2022 is down to -80.7%, compared with the other two major backbone of the airline net interest rate in 2022, China Southern Airlines -37.6% and Air China -73.0% significantly larger losses. From the net interest rate of this indicator which reflects the Eastern Airlines Group in the three-year epidemic period by the market contraction and the impact of external pressure is more obvious. After three years of market downturn, starting from the optimization of the market environment in 2023, the financial position of China Eastern Airlines Group continued to recover and grow. In terms of asset turnover, China Eastern's 2023 asset turnover ratio was 40.3%, a significant increase from 16.2% in 2022, and closer to the other two major backbone carriers' 2023 asset turnover ratios of 51.7% for China Southern Airlines and 42.1% for Air China. In terms of net margin in 2023, China Eastern Airlines was -7.2%, a smaller loss compared to Air China's -25.9% and Air China's -7.4%. This reflects that China Eastern Airlines Group has continued to recover and move toward turning losses into profits in terms of its financial position, and has a stronger growth momentum than the other two major domestic backbone airlines. With the favorable development trend in 2023, China Eastern Airlines Group is expected to continue to play a leading role in the industry in its subsequent development, and to respond positively to changes in the market and the challenges of competition.<sup>[2]</sup>



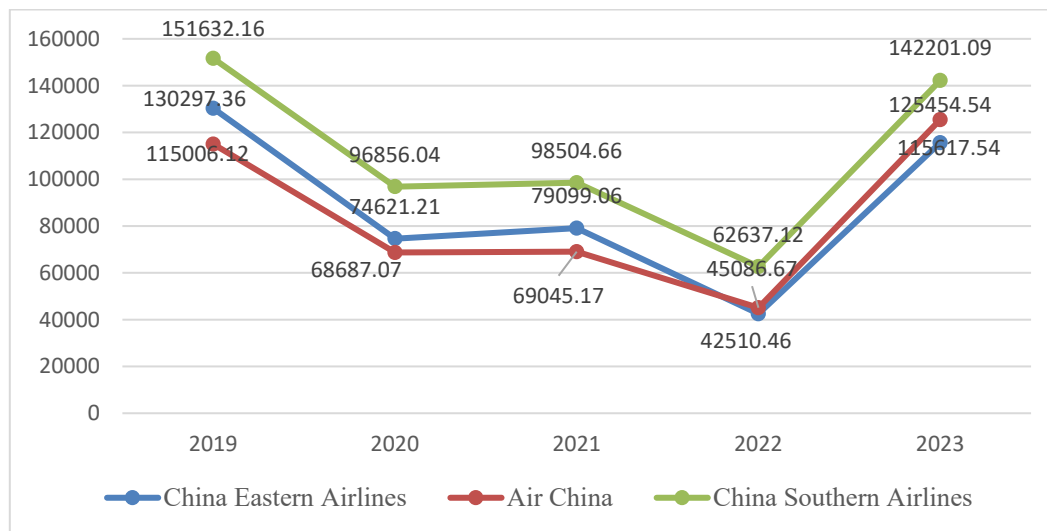
(Data source: China Eastern Airlines Group annual report)

Figure 1: Net profit margin of China's three major airlines (percentages) from 2019 to 2023

### 2.2. Customer side - Steady recovery of competitiveness after a period of market contraction

Over the past five years, China Eastern Airlines has faced severe development difficulties due to the severe market environment and external pressures from 2020 to 2022, which have caused a huge impact on China Eastern Airlines, with a significant decline in passenger and cargo traffic. In 2020, compared with 2019, the Group carried 42.73% fewer passengers, 11.52% fewer seats, and 10.60% fewer composite load factor. Compared with Air China and China Southern, the two other major domestic backbone carriers, China Eastern's performance suffered a slightly larger setback during the same period. The number of passengers carried by Air China declined by 40.28% and the combined load factor fell by 12.61%, while the number of passengers carried by China Southern Airlines declined by 36.12% and the passenger load factor fell by 11.35%. After a three-year trough, China Eastern Airlines Group recovered

strongly in 2023 and basically returned to its 2019 level of development, and compared with the other two major backbone airlines, some of its figures increased more, and there were highlights in terms of operational performance. In terms of consolidated load factor, China Eastern Airlines will grow by 9.26% in 2023 compared to 2022, which is a larger increase compared to Air China's growth of 8.37% and China Southern Airlines' growth of 3.87%. In terms of the number of passengers carried, according to Figure 2, China Eastern Airlines will increase by 171.97% in 2023 compared to 2022, which is a large increase compared to Air China's growth of 127.02% and Air China's growth of 178.25%. This fully demonstrates that the competitiveness of China Eastern Airlines Group is steadily recovering to the level of 2019 after a period of market contraction, and that more customers will choose China Eastern Airlines Group as a carrier during the period of market recovery, with a higher potential for customer growth in the future.<sup>[3]</sup>



(Data source: China Eastern Airlines Group annual report)

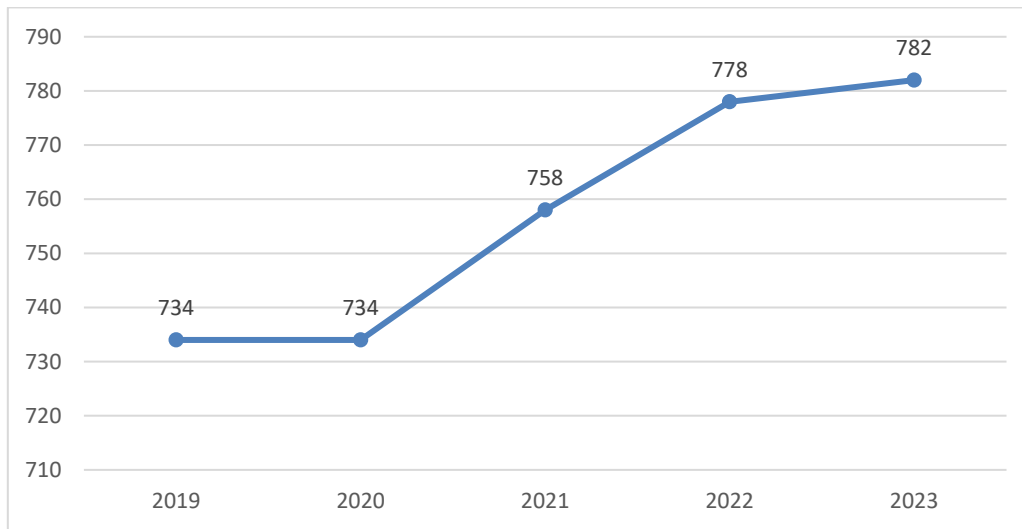
Figure 2: Number of passengers carried by China's three major airlines (in thousands) from 2019 to 2023

### 2.3. Internal Operations - Continued Leadership in Route Network and Fleet Construction

China Eastern Airlines has built a world-class aviation hub with Shanghai's two major airports as its core, strengthened its ties with other domestic hubs, and implemented national strategies to expand domestic and international aviation markets, resulting in an extensive route network architecture. The Group's two-hour flight circle covers 90% of China's population and 54% of the country, while its international routes cover many economically developed and densely populated regions abroad. Currently, China Eastern Airlines Group has a total of 926 passenger routes, including 754 domestic routes and 172 international routes, connecting 244 cities around the world, and was one of the few airlines operating domestic routes to Europe, the United States and Australia during the epidemic. 2023, China Eastern Airlines Group's annual domestic and international passenger traffic has recovered to 97.5% of 2019's level and 38.8% of 2019's level, respectively. 38.8 percent. At the same time, China Eastern Airlines will take full advantage of its membership in the SkyTeam alliance to further expand its destinations to 1,150 cities in 175 countries and regions.

China Eastern Airlines has been actively promoting the modernization of its aircraft types and has become one of the world's leading carriers with its large and young fleet. According to Figure 3, it can be seen that China Eastern Airlines currently owns 782 aircraft, ranking among the top of the world's fleet size, with an average fleet age of 8.7 years, an increase in the number of aircraft compared with 734 in 2019, reflecting that China Eastern Airlines Group has still achieved growth in fixed assets after a three-year period of market contraction. The number of wide-body passenger aircraft is 106 and covers a wide range of the world's most advanced models, such as the Boeing 777-300ER and the Airbus A330-300 and A350-900, etc., while the Group mainly owns 379 narrow-body passenger aircraft, which are currently the most mainstream and highly efficient Airbus A320s. In addition, China Eastern Airlines Group also actively introduces domestically produced COMAC C909 (formerly known as ARJ21) airliners and C919 airliners, and is the first airline in the world to commercially operate domestically produced airliners, COMAC C919 airliners, which contributes to the promotion of China's development

from a major aviation country to an aviation powerhouse, and demonstrates a strong impetus for sustained development and a broad outlook.



(Data source: China Eastern Airlines Group annual report)

Figure 3: Number of aircraft in China Eastern's fleet (aircrafts) from 2019 to 2023

#### 2.4. Learning and growth - high emphasis on talent development

Over the past five years, despite a three-year period of market contraction and external pressures, the Group has attached great importance to the learning and growth of its employees. On the one hand, the Group emphasizes and strengthens the construction of its service team, establishes a strong brand influence and value through the innovation and improvement of its air service team, builds a world-class air service team to make the China Eastern Airlines brand a business card in the industry, and in 2023, the Group will be recognized as one of the top 50 most valuable Chinese brands under the Global Brand Communication Group. On the other hand, the Group attaches great importance to its talent strategy, vigorously introduces and cultivates high-end aviation talents, and continuously improves incentive mechanisms to ensure that these talents can fully develop their talents, such as increasing the training of the "Lingyan" model crew to create a high-quality flight attendant service team. By continuing to strengthen its aviation team building and high-end aviation talents, China Eastern Airlines Group has maintained its talent strength and advantages among many airlines, laying a solid foundation for subsequent development and providing a better development space for subsequent employees to learn and grow.

### 3. Risks to China Eastern Airlines' development performance

#### 3.1. Financial aspects - oil price and exchange rate fluctuation risk

China Eastern Airlines faces financial risks arising from fluctuations in jet fuel prices and exchange rate changes. In respect of jet fuel prices, as jet fuel accounts for a significant portion of operating costs and is affected by a variety of factors, its price and security of supply have become a major risk in 2023 as a result of rising demand due to the market rebound. As the main operating cost of China Eastern Airlines Group, the price fluctuation of aviation fuel had a significant impact on its operation. 2023 aviation fuel cost of China Eastern Airlines Group amounted to RMB41.102 billion, accounting for 36.55% of the current year's operating cost, representing a significant increase of 84.89% compared to 29.74% in 2022, making it the largest cost component. Meanwhile, international geopolitical events such as the Russia-Ukraine conflict and the Israeli-Palestinian conflict made international oil prices fluctuate, and the Red Sea shipping crisis continued to threaten the security of jet fuel supply channels, highlighting the importance of jet fuel prices and security of supply in financial risk. At the level of exchange rate risk, China Eastern Airlines Group's lease liabilities and loans are mostly denominated in U.S. dollars, and its U.S. dollar debt and international business income and expenditure are affected by fluctuations in the exchange rate of foreign currencies, such as the RMB against the U.S. dollar, posing a challenge to the company's solvency and capital turnover, etc. In 2023, the U.S. dollar accounted for 15.86% of the

Group's interest-bearing debt, and accounted for 88.73% of the total interest-bearing debt denominated in foreign currencies. The U.S. trade war with China and the complexity of the U.S.-China relationship have caused fluctuations in the exchange rate of the RMB against the U.S. dollar, which will affect the Company's foreign exchange reserves and capital turnover, and in turn pose a greater challenge to the financial security of China Eastern Airlines Group.

### ***3.2. Customer side - shrinking passenger sources***

China Eastern Airlines is currently facing a number of challenges in expanding its passenger source market. In the international consumer market, due to the impact of the U.S. trade war with China, changes in foreign-funded enterprises in China may lead to a decline in the number of foreigners traveling to China, which will increase the operating costs of the routes and put pressure on the Group to develop the international passenger source market. In the domestic consumer market, the flow of people gradually recovered after the epidemic, but due to the lack of economic growth momentum, the public's willingness and ability to consume has not yet achieved a strong rebound, while the current severe employment situation and economic pressures have resulted in a low proportion of people choosing aviation as their preferred mode of travel, which will constrain China Eastern Airline Group's development of domestic routes for passengers.<sup>[4]</sup>

### ***3.3. Internal operations - peer competition and substitution risk***

In 2023, the market environment in which the Group operates will continue to face competition from various sources. In terms of peer competition, although some small and medium-sized private airlines have gone bankrupt after the three-year market closure period from 2020 to 2022, the number of major competitors of the Group has not been significantly reduced and the Group is still subject to strong competitive pressure on domestic and international routes from the other two major domestic airlines, namely Air China and China Southern Airlines. In terms of market competitiveness, both Air China and China Southern Airlines will see significant recovery and improvement in 2023, with Air China's combined capacity of 2,925,131.6 million Available Seat Kilometers (ASKs) and 9,648,190.0 million Available Freight Tonne Kilometers (ATKs) in 2023, an increase of 13.36% compared to 2022. Available Seat Kilometers (ASK) totaled 316,217.46 million, an increase of 105.55% from 2022, and Available Freight Tonne Kilometers (ATK) totaled 44,898.59 million, an increase of 71.23% from 2022. This strong recovery signals the white-hot competition in the domestic civil aviation market. In particular, Air China, with its Beijing-based advantage, has air rights and distance advantages on routes to and from countries in the European Union and North America, which will pose a huge competitive challenge for the China Eastern Group to develop its international business, especially routes in Europe and the United States. In terms of substitution risks, China has achieved remarkable results in the construction of its high-speed rail network. By the end of 2023, the total operating mileage of China's railways reached 159,000 kilometers, with high-speed rail accounting for 45,000 kilometers. Compared with 2019, when the operating mileage of railways was 140,000 kilometers and that of high-speed rail was 35,000 kilometers, the growth is significant. Moreover, the network continues to expand to the central and western regions as well as areas with inconvenient transportation. This indicates that the development of railway transportation has not come to a standstill due to the market contraction period from 2020 to 2022. In terms of short- and medium-haul transportation, there is a risk of diversion of passenger sources by high-speed rail. Although the domestic short- and medium-haul routes of China Eastern Airline Group account for a relatively low percentage of the total number of routes and the impact is relatively limited at present, high-speed rail is gradually becoming a competitor of the Group in terms of long-haul transportation with the improvement of high-speed rail's hourly speed, the increase in line density and the impact of factors such as the long waiting time for civil aviation flights.

### ***3.4. Learning and Growth - Shortage of High-end R&D Talents***

Currently, the EAC Group is still facing the challenge of insufficient aviation professionals in the learning and growth of its employees. From the perspective of the EAC Group's R&D personnel in 2023, the number of R&D personnel accounted for only 2.36% of the Company's total headcount, and is on a downward trend compared to the 2.94% in FY201021 which is still in the period of market contraction, which will have a more unfavorable impact on the future scientific and technological innovations and product research and development of the EAC Group. This will have a relatively unfavorable impact on the Group's future technological innovation and product development. In addition, from the perspective of the distribution of the educational structure of the Group's R&D personnel, the vast majority of R&D

personnel have a bachelor's degree or below, and the proportion of R&D personnel with a graduate degree will only increase from 14% in 2021 to 15% in 2023, a slow growth rate and a low proportion, which highlights that there is still a large talent gap in the Group's construction of the R&D personnel team.<sup>[5]</sup>

#### **4. Suggestions and countermeasures against the performance risk of China Eastern Airlines**

##### ***4.1. Financial aspects - diversification to reduce liability risk***

China Eastern Airlines Group can adopt hedging method as one of the main means for the company to manage exchange rate risk, by buying or selling forward contracts and options in the foreign exchange market in the opposite direction of the expected future cash flow as a way to lock in the future exchange rate and to reduce the uncertainty due to exchange rate changes. Raise foreign - currency funds through methods like issuing new shares, bringing in foreign strategic investors, and issuing preferred shares. Use these funds to acquire foreign - currency assets or pay off foreign - currency debts, gradually reducing the proportion of foreign - currency liabilities, thereby lessening the impact of exchange - rate fluctuations on the company's financial situation. The China Eastern Airlines Group can take the approach of diversifying the types of debt by utilizing currency swap contracts, cross-currency swaps and other methods to promote the diversified operation of the types of foreign-currency debt and to reduce the single-currency risk. China Eastern Airlines Group can strengthen foreign exchange risk early warning and monitoring, improve the risk management mechanism, and combine the foreign exchange risk early warning procedures with foreign exchange risk identification, assessment and response procedures to form a complete risk management system. Through regular risk assessment and analysis, the company can ensure that it can respond to various foreign exchange risks in a timely manner.

##### ***4.2. Customers - Actively developing the international market and optimizing route networks***

Since the Russia-Ukraine conflict in 2022, the sanctions imposed by Western countries on Russia have led to the closure of airspace between the EU and Russia. Airlines from Europe and the U.S. have been unable to fly over Russian airspace according to their original routes, and have had to take a detour through the airspace of Central Asia or the Middle East, which has resulted in longer flight times, a decrease in the number of passengers, and an increase in the cost of jet fuel. Since Chinese airliners are not subject to this ban, they can still fly over EU and Russian airspace on their original routes. Meanwhile, because China Eastern Airlines Group has Shanghai as its hub and its routes tend to be in the north, it has a greater advantage in terms of flight time and cost efficiency than the other two major airlines in China as well as foreign airlines in terms of flight time and cost efficiency in flying European and American routes that need to pass through Russian airspace. China Eastern can take full advantage of this policy to expand into international markets, increase revenues and diversify its markets. For example, the Group can continue to optimize its route layout and increase the number of flights to and from the European Union and North America in order to attract more domestic and international passengers and increase the passenger load factor of its flights. At the same time, the Group will leverage its strengths as a member of the SkyTeam alliance to strengthen cooperation with more overseas airlines, such as deepening cooperation with Delta Air Lines and Paris-based Air France-KLM, both of which are also members of the alliance, to expand the scope of code-sharing and to continue to diversify the market, thereby increasing the Group's influence and market share in the overseas air transportation market. We will continue to diversify our market players and increase our influence and market share in overseas air transportation markets.<sup>[6]</sup>

##### ***4.3. Internal operations - Multi-channel protection of liquid asset prices and fuel supply chain stability***

The Group can build a diversified fuel supplier system to reduce its dependence on a single supplier and enhance the stability and resilience of its supply chain. For example, by establishing long-term cooperative relationships with a number of aviation fuel suppliers such as CNOOC, the Group will be able to obtain a stable fuel supply in the event of fluctuations in the supply of aviation fuel. At the same time, the Group can also make full use of financial instruments for fuel hedging, which is also an important means for major airlines to manage fuel price risks, by locking in the purchase price of aviation fuel for a certain period of time in the future through futures and options and other derivatives contracts, so as to effectively hedge the operational risks arising from the volatility of fuel prices. In addition, China Eastern Airlines Group can also increase investment in energy conservation and emission reduction. It can introduce aircraft models equipped with advanced engine technology and lightweight designs. For

example, in the future, on Asian international routes, it can consider introducing advanced aircraft such as the Airbus A330 - 800neo or A321XLR. At the same time, by continuously optimizing flight procedures and other means, the efficiency of aviation fuel use can be improved, and operating costs can be continuously reduced. Moreover, the Group should continuously pay attention to and evaluate the application prospects of new energy technologies in the aviation field, so as to prepare for the transformation and development of the aviation industry in the future.

#### **4.4. Learning and Growth - Increase Talent Cultivation Efforts**

China Eastern Airlines Group can increase the cultivation and introduction of talents by signing contracts with domestic aviation science and technology colleges and universities to cultivate more aviation talents for China Eastern Airlines Group in the form of school-enterprise cooperation. For example, it can strengthen the cultivation of pilots and aviation logistic support personnel with the Civil Aviation University of China (CAUC) and Civil Aviation Flight School of China (CFSC), and introduce more high-quality talents. At the same time, China Eastern Airlines Group can increase post-employment education for its existing employees. With the expanding application of artificial intelligence and big data, China Eastern Airlines Group can make full use of its information and resource advantages, such as big data, to better provide learning opportunities for its employees and improve the efficiency and quality of its work, and to lay a solid foundation for the construction of a professional aviation talent team.

### **5. Conclusion**

China Eastern Airlines, with its strong assets, world-leading fleet size and young fleet structure, and extensive network of destinations, provides passengers with high-quality air transportation services and is well recognized by the market. During the three-year market contraction period, despite severe external pressures, the airline has been able to withstand the impact of declining market size more effectively than other carriers and maintain its competitive advantage to the greatest extent possible. Currently, the Group's financial position is being optimized and revenues are gradually recovering. At the same time, the high-quality development of China's economy and the "One Belt, One Road" strategy have provided favorable development opportunities for the Group. However, the Group also faces performance risks in the recovering market environment, including fluctuations in oil prices and exchange rates, shrinking passenger sources, competition and substitution risks in the same industry, and shortages of high-end research and development talents. In this regard, China Eastern Airlines Group can effectively address the current performance issues by diversifying and reducing liability risks, securing liquid asset prices and fuel supply chain stability through multiple channels, optimizing its route network, and increasing its talent training efforts. Through a higher level of financial planning and the implementation of countermeasure strategies, China Eastern Airlines Group is expected to continue to improve its performance in the future, and continue to play its role as a centralized enterprise in the process of realizing the goal of becoming a transportation powerhouse, and to promote the sustainable development of itself and China's civil aviation industry as well as its competitiveness in the international market.

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