THE CONTROL AND COUNTERMEASURES OF AVIATION FUEL COST OF AIRLINES IN CHINA---A CASE STUDY OF CHINA EASTERN AIRLINES

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THE CONTROL AND COUNTERMEASURES OF AVIATION FUEL COST OF AIRLINES IN CHINA---A CASE STUDY OF CHINA EASTERN AIRLINES

Thematic Certificate

To

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Title: The Control and Countermeasures of Aviation Fuel Cost of Airlines in China---A Case Study of China Eastern Airlines

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ABSTRACT

This paper aimed to study the control and countermeasures of aviation fuel cost of China Eastern Airlines with the following objectives: 1) To explore the external factors and causes of high aviation fuel costs; 2) To explore the internal factors and causes of high aviation fuel costs; 3) To establish the airline fuel cost management system.

Through documentary research, this paper applied cost management theory, activity-based costing theory and risk management theory to construct the aviation fuel cost management system of airlines, including aviation fuel consumption management system and aviation fuel price management system. The result founds that: 1) The increase in aviation kerosene prices as a direct external factor of high fuel costs and the inevitability of administrative pricing as an indirect external factor of high fuel costs; 2) Inadequate management of aviation fuel consumption and poor risk control of aviation fuel prices were internal factors for high airline fuel costs; 3) The problem of high aviation fuel cost of airlines can be effectively solved by using aviation fuel consumption management system and aviation fuel price management system, as well as correct and reasonable hedging strategy: firstly to implement refined aviation fuel control; secondly is to improve flight crew operations, reduce aviation fuel costs, and do a proper job in aviation fuel cost control; and finally, in the process of China Eastern Airlines aviation fuel cost risk management and control, it should reasonably use aviation fuel price hedging strategy, improve aviation fuel hedging risk management, and control system, and open up new ways of risk management and control.

Keywords: cost management theory, activity-based costing theory, risk management theory

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Declaration

I, LI CHANG WEI, hereby certify that the work embodied in this independent study entitled "Analysis on the Control and Countermeasures of Aviation Fuel Cost Airlines in China---Case study based on China Eastern Airlines" is result of original research and has not been submitted for a higher degree to any other university or institution.

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1. Introduction

1.1 Research Background

Based on the continuous rise in international oil prices, the operating costs of airlines have gradually risen. To maintain their current profitability and maintain the normal operation of their companies, many Chinese airlines have decided to implement the decision to resume the levy of fuel surcharges on domestic routes (Zhang, 2018). The levy of fuel surcharges on domestic routes has a great impact. As one of China's three major state-owned backbone airlines, China Eastern Airlines is also deeply affected by rising international oil prices. In the cost structure of airlines, aviation fuel costs account for the highest proportion, generally around 25 to 30%. Therefore, the rise in international oil prices is bound to affect the profitability of domestic airlines (Liu, 2015).

At the same time, economic globalization and frequent population and resource flows have made the air transportation market fiercer. Aviation fuel cost management is significant to enable our airlines to gain a favorable position and obtain more profits in the fierce competition (Xu, 2015). Aviation fuel cost management is playing an increasingly important role in today’s competition among airlines. Advanced aviation fuel cost management will enable airlines to participate in market competition at low cost, conducive to adopting flexible promotional strategies and gaining more large profit margins. Implementing a reasonable and efficient aviation fuel cost control is an essential strategy for the long-term development of aviation companies. By achieving low aviation costs, airlines can seize more markets, earn high profits, and take the lead in the fierce market competition.

On the other hand, with the deterioration of the global environment, energy conservation and emission reduction will become a basic element in the cost control of aviation fuel for airlines, running through the formulation, implementation, and improvement of fuel-saving measures. On September 22, 2020, the Chinese government proposed at the 75th United Nations General Assembly: "China will increase its national independent contribution and adopt more powerful policies and measures. We strive to reach the peak of carbon dioxide emissions by 2030 and strive to achieve carbon neutrality by 2060." (Chen, 2022). From the perspective of the cost structure of airlines, aviation fuel is the energy consumption item, and cost expenditure of my country's civil aviation industry is second only to labor costs, and fuel-saving has become the focus of airline cost control. If airlines want sustainable development, they must increase load factor, energy consumption rate, and other indicators, take the path of fuel-saving and cost reduction, green aviation, and achieve a harmonious and win-win situation of corporate benefits, efficiency, and social responsibility.

1.2 Research Problems

As one of the three main costs of airlines, aviation fuel cost has always been an important part of airlines' cost management. Smaller fluctuations in aviation fuel costs

will have a significant impact on airline profitability. Therefore, the problem of exploring what external factors is responsible for the high cost of jet fuel and how to avoid them is raised.

With the gradual recovery of international fuel prices after bottoming out, aviation fuel costs will put more significant pressure on airlines to achieve profit targets. Therefore, airlines need to control aviation fuel costs precisely and improve cost management to increase revenue, reduce expenditures, and increase profits. According to the reasons described above, the problem of exploring which internal factors is responsible for high aviation fuel costs and what approaches airlines can take to effectively address aviation fuel cost management is raised.

1.3 Objective of the study

This paper of this research is to analyze the status of aviation fuel cost management of airlines, summarize the main problems in aviation fuel cost management, build an aviation fuel consumption management system based on the operation cost method from aviation fuel consumption management, and build an aviation fuel price management system based on risk management from aviation fuel price management, to improve the aviation fuel cost management.

The objectives of the study are:

1. To explore the external factors and causes of high aviation fuel costs.
2. To explore the internal factors and causes of high aviation fuel costs.
3. To establish the airline fuel cost management system.

1.4 Scope of the study

This study focuses on the fuel cost management of Chinese airlines. This is mainly since aviation fuel costs account for the highest proportion in the cost structure of airlines and the rising international oil prices make the importance of aviation fuel cost control more obvious. This paper reviews a large amount of literature and theories on optimizing pilot operations and aircraft performance, the use of operational costing method in airline cost control and improving airline operation management for aviation fuel cost control around the use of risk management in airline cost control. Optimization of fuel cost control from three aspects, using theories such as operation cost method and risk management theory, solved the problems and reasons for the control of aviation fuel cost. The improvement measures of aviation fuel cost control are obtained. It is useful for airlines to explore the cost potential from a deeper degree and reduce aviation fuel costs, which has certain practical significance.

1.5 Research Significance

As the degree of internationalization of Chinese airlines continues to deepen, the cost of Chinese airlines' aviation fuel is greatly affected by changes in international oil prices. At the same time, aviation fuel cost occupies a large proportion of the cost structure of Chinese airlines. A small change in aviation fuel cost will have a significant impact on

airline profits. Aviation fuel cost has become a bottleneck for the development of Chinese airlines. Advanced aviation fuel cost control measures will enable airlines to compete in the market with low cost and facilitate flexible promotion marketing strategies, thus gaining greater profitability. The implementation of reasonable and efficient fuel cost control strategies is an important strategy for airline companies to achieve long-term development. The implementation of a reasonable and efficient fuel cost control strategy is an important strategy for the long-term development of airline companies.

In the current environment of the aviation industry, China Eastern Airlines, as a representative enterprise among China's state-owned aviation companies, is in an operating environment that many other airlines are facing or will face. Therefore, China Eastern Airlines was selected as the research object.

This article selects China Eastern Airlines to study its cost control, especially the control of aviation fuel costs. The purpose is to combine China's current structural reform environment to conduct in-depth and different aspects of China Eastern Airlines' aviation fuel cost control from different levels and dimensions. Comprehensive analysis, and on this basis, with the scientific guidance of risk management theory, (Sun, & Liu, 2011). the airline's aviation fuel cost process is constructed and optimized through the activity-based costing method (Liu, 2014). At the same time, it also has a certain degree of impact on the activity-based costing method and risk management theory. The connotation has been enriched and expanded theoretically.

The significance of this study is to allow China Eastern Airlines to reduce costs and improve quality and efficiency through continuous improvement and development of aviation fuel cost control measures when facing fierce market competition; it also provides a reference for other aviation companies in the industry, to promote the practical improvement of the overall operational capabilities of the industry.

2. Literatures Review

2.1 Background of China's jet fuel administrative pricing

China's planned airport construction has resulted in the highest jet fuel prices in the world, and this system of airport construction has led the General Administration of Civil Aviation to build airports at a loss, and the easiest and fastest way to keep them operating at a loss is to maintain planned jet fuel pricing. As a result, the cost of jet fuel for airlines is increasing and passengers are forced to accept the additional costs that are passed on.

The International Air Transport Association, which has more than 240 airline members, has said at an event that China has one of the highest aviation fuel prices in the world, and that all major airports in Asia have lower jet fuel feed and sales differentials than China (Wang,2019).In response to China's administrative pricing, many international airlines have filled their fuel tanks to the brim on international flights to China to reduce the cost of jet fuel in China. China's monopolistic high pricing policy has forced many foreign airlines to add more capital burden to the cost of jet fuel, but the overall weight of the aircraft affects the amount of fuel consumed by the aircraft to a certain extent, which means that the more weight the flight has, the more fuel is consumed, and the high fuel cost reduced by carrying more fuel is not necessarily smaller than the cost of more fuel consumed in flight, nor does it meet the requirements of energy conservation and emission reduction. In addition, most international most countries have more than one supplier of jet fuel and are free to choose when refueling, but in China's monopolistic pricing in China, there is only one supplier to choose from.

International crude oil prices began to rebound in February 2016 and have risen by about 133% by October 2018 (taking WTI crude oil prices as an example). 2017 oil prices continued to rise mainly due to the gradual reduction of oil inventories, and various geopolitical tensions. 2018 has seen the strengthening of the US dollar, geopolitical stability, and Saudi Arabia's announcement that it will increase the supply of oil, effectively the trend of rising oil prices has slowed down, with international crude oil prices falling by more than 33% in the nearly two-month period from mid-October 2018 to early December of the same year (Wang,2020).

Data source: wind

Figure 2.1 Ex-factory price of aviation kerosene

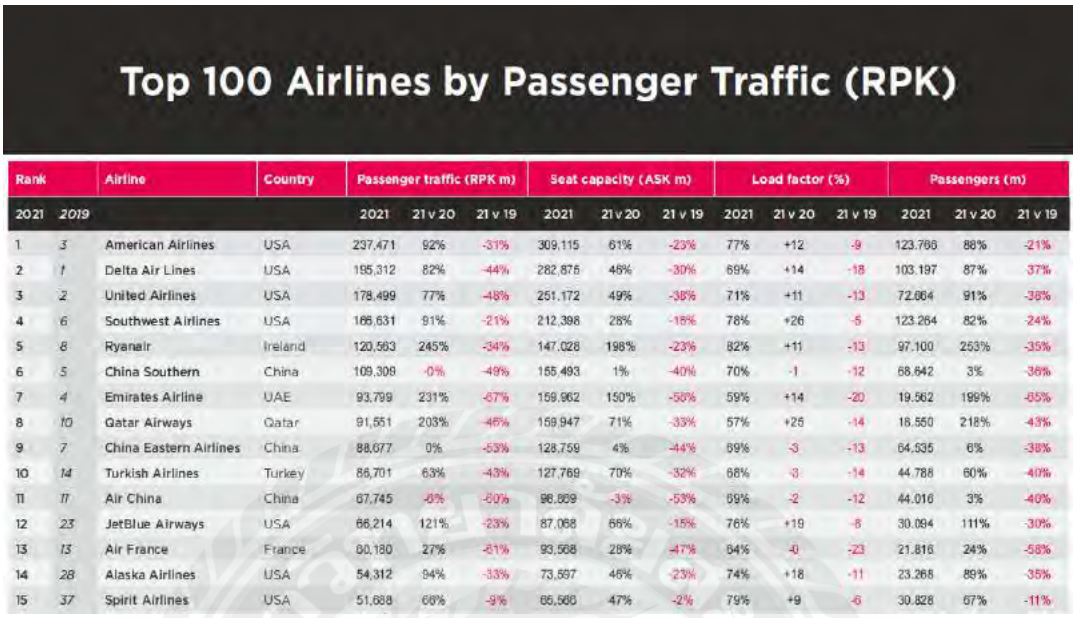
With international oil prices bottoming out and gradually picking up, the increase in jet fuel costs will put airlines to meet their profit targets. Therefore, to increase revenue and reduce and increase profits, it is necessary for airlines to specifically control jet fuel costs and improve the management level of jet fuel costs. The company's management level of jet fuel costs should be improved.

The ex-factory price of aviation kerosene in China is priced by the government. According to the price adjustment mechanism of refined oil products, when the moving average price of crude oil in the international market changes by more than 4% for 22 consecutive working days, the price of domestic refined oil products can be adjusted accordingly. However, the final decision on whether to adjust the price is made by the government.

2.2 China Eastern Airlines

Headquartered in Shanghai, China Eastern Airlines Group Limited is one of the three state-owned backbone air transport groups in China, with its predecessor dating back to the first flight squadron established in Shanghai in January 1957. By the end of 2020, the total assets of China Eastern Airlines Group exceeded RMB 368 billion, with more than 100,000 employees, and its business covers aviation passenger transportation, aviation logistics, aviation finance, aviation real estate, aviation food, financial leasing, import and export trade, aviation media, industrial development, industrial investment, and other aviation-related industries. Based on establishing an integrated system of modern aviation comprehensive services, the Group has made every effort to build three main businesses,

namely, full service, low-cost and logistics, and five industrial sectors, namely, MRO, aviation food, science and technology innovation, finance and trade, and industrial investment platform.



Top 100 Airlines by Passenger Traffic (RPK)

Rank		Airline	Country	Passenger traffic (RPK m)			Seat capacity (ASK m)			Load factor (%)			Passengers (m)		
2021	2019			2021	21 v 20	21 v 19	2021	21 v 20	21 v 19	2021	21 v 20	21 v 19	2021	21 v 20	21 v 19
1	3	American Airlines	USA	237,471	92%	-31%	309,115	61%	-23%	77%	+12	-9	123.788	88%	-21%
2	1	Delta Air Lines	USA	195,312	82%	-44%	282,876	46%	-30%	69%	+14	-18	103.197	87%	-37%
3	2	United Airlines	USA	178,499	77%	-48%	251,172	49%	-38%	71%	+11	-13	72.664	91%	-38%
4	6	Southwest Airlines	USA	166,631	91%	-21%	212,398	28%	-16%	78%	+26	-5	123.264	82%	-24%
5	8	Ryanair	Ireland	120,563	245%	-34%	147,028	198%	-23%	82%	+11	-13	97.100	253%	-35%
6	5	China Southern	China	109,309	-0%	-49%	155,493	1%	-40%	70%	-1	-12	68.642	3%	-36%
7	4	Emirates Airline	UAE	93,799	231%	-67%	159,962	150%	-58%	59%	+14	-20	19.562	199%	-65%
8	10	Qatar Airways	Qatar	91,551	203%	-46%	159,947	71%	-33%	57%	+26	-14	18.550	218%	-43%
9	7	China Eastern Airlines	China	88,677	0%	-53%	128,759	4%	-44%	69%	-3	-13	64.535	6%	-38%
10	14	Turkish Airlines	Turkey	86,701	63%	-43%	127,769	70%	-32%	68%	-3	-14	44.788	60%	-40%
11	11	Air China	China	67,745	-6%	-50%	98,809	-3%	-53%	69%	-2	-12	44.016	3%	-40%
12	23	JetBlue Airways	USA	66,214	121%	-23%	87,068	66%	-15%	76%	+19	-6	30.094	111%	-30%
13	13	Air France	France	60,180	27%	-61%	93,568	28%	-47%	64%	-0	-23	21.816	24%	-58%
14	28	Alaska Airlines	USA	54,312	94%	-33%	73,597	46%	-23%	74%	+18	-11	23.268	89%	-35%
15	37	Spirit Airlines	USA	51,688	66%	-9%	85,566	47%	-2%	79%	+9	-6	30.828	67%	-11%

Figure 2.2 Top 100 airlines in terms of passenger traffic

Source: Cirium, Tracked Utilization Data, date filed November 30, 2021.

China Eastern Airlines Corporation, the core main business of the Group, is the first Chinese airline to be listed in New York, Hong Kong, and Shanghai. By the end of 2020, the fleet size of China Eastern reached more than 730 aircraft, one of the youngest fleets among global scale airlines, and has the largest Internet wide-body fleet in China with leading commercial and technical models. Currently, China Eastern has built a dual-core hub network with Shanghai and Beijing as its main hubs, and through the SkyTeam alliance, it has access to 1,036 destinations in 170 countries and regions around the world, serving more than 130 million passengers annually and ranking among the top 10 in the world in terms of passenger traffic.

2.2.1 Current cost situation of China Eastern Airlines

In the current operation, the costs in the accounting system of China Eastern Airlines generally consist of two modules, namely, main operating costs and period costs. Among them, "main operating costs" refers to the various costs incurred by the airline's aircraft during flight, including direct costs and indirect costs. Direct costs include crew salaries and benefits, aviation fuel costs, depreciation of aircraft and engines, airport service charges, and in-flight catering costs. (Liu,2020) Period costs are costs incurred in the current period that cannot be directly charged to the product of a certain route, including several aspects such as control, sales, and finance. Some of the above direct and indirect costs are considered as rigid costs of the company, including airport service charges, insurance, maintenance costs, etc. These costs are difficult to control, so the company must absorb them. In addition, the expenditure of funds such as labor cost and finance cost are regarded as the soft cost of the company, which can be considered as controllable factors.

Project Name	Amount for the period	Percentage of total costs for the period (%)	Same period last year	Percentage of total costs in the same period of the previous year (%)	Percentage change in the current period over the previous year (%)
Aviation fuel consumption	20,593	25.73	13,840	19.55	48.79
Airport landing fees	10,251	12.81	9,331	13.18	9.86
Meals & Supplies	1,655	2.07	1,589	2.24	4.15
Employee Compensation	16,878	21.09	16,413	23.18	2.83
Aircraft and engine depreciation	19,091	23.85	18,996	26.83	0.50
Aircraft and engine repair cost	3,783	4.72	3,451	4.87	9.62
Civil Aviation Infrastructure Fund	852	1.06	-	-	Not applicable
Other operating cost	5,636	7.04	5,464	7.72	3.15
Other operating expenses	1,302	1.63	1,719	2.43	-24.26
Total operating costs	80,041	100.00	70,803	100.00	4.68

Unit: million Chinese Yuan

Data source: China Eastern Airlines 2021 Annual Report

Table 2.1 Cost Analysis of China Eastern Airlines in 2021

For civil aviation companies in many countries around the world, jet fuel costs have always been a high percentage of the total investment and operating costs of aviation companies. The cost of jet fuel has always occupied a high proportion in the total investment and operation cost of aviation enterprises. When international oil prices develop and change, jet fuel costs also change, and when oil prices gradually rise then jet fuel cost also rises year after year. The cost of jet fuel occupies an important position in

the cost structure of Eastern Airlines and

It is the primary factor that affects the company's revenue.

Year	2017		2018		2019	
Project Name	Amount	Percentage	Amount	Percentage	Amount	Percentage
Aviation fuel consumption	25131	29.75%	33680	32.89%	34191	31.89%
Airport landing fees	13254	15.69%	14914	14.56%	14657	13.67%
Meals & Supplies	3090	3.66%	3383	3.30%	3667	3.42%
Employee Compensation	8869	10.5%	17624	17.21	19742	18.42%
Aircraft and engine depreciation	12446	14.73%	13496	13.18%	19704	18.38%
Aircraft and engine repair cost	3380	3.15	3738	3.65	-9.58	3.15%
Operating lease payments	5346	6.33%	3738	3.65%	3380	0.02%
Other operating cost	11121	13.16%	7274	7.10%	6871	6.41%
Other operating expenses	3901	4.62%	3992	3.90%	3164	2.95%
Total operating costs	84476	100%	102407	100%	107200	100%

Unit: million Chinese Yuan

Table 2.2 Cost components of China Eastern Airlines

The cost of Eastern Airlines has steadily increased in the past three years. Aviation

fuel costs account for the largest share, remaining roughly at around 30%. It reached 32.89% in 2018. The second cost item is employee compensation and flying. Delivery depreciation costs are generally maintained at around 17%. The share of aviation fuel costs is about 15 percentage points higher than the share of employee compensation and delivery depreciation costs. The data shows that the company's highest operating cost is still aviation fuel cost. Therefore, effective control of aviation fuel cost is one of the most important tasks for the company at this stage.

China Eastern Airlines can adopt the Activity-Based Costing to account for and allocate the cost of aviation fuel consumed in each stage, to achieve the purpose of optimizing the way of accounting for aviation fuel. The aviation fuel consumption is mainly reflected in the two stages of ground operation and flight operation. The calculation method of operation costing is calculating the aviation fuel cost of each operation according to the total amount of aviation fuel consumption and aviation fuel price.

2.3 Cost management theory

Cost management activity is essentially a management activity, but also has its own characteristics. Cost management is the activity of managing costs and expenses through methods such as forecasting, decision-making, accounting, analysis, control, and assessment (Wan, 2007). Cost management is a management activity that includes methods such as forecasting, decision-making, planning, control, accounting, analysis, assessment, and inspection. The above point of view pointed out the essence of cost management and pointed out the specific methods included in cost management (Liu, 2014). Therefore, cost management can be defined as an activity in which an enterprise uses forecasting, decision-making, accounting, analysis, control, evaluation, and other methods to effectively reduce costs.

Cost management is specific to the content and involves specific methods. The cost method reflects the content of cost management. This article believes that the content of cost management mainly includes the following six aspects, namely forecasting, decision-making, control, accounting, analysis, and assessment.

Combined with the practice of aviation fuel cost management of airlines, since the main operations in the airline service operation process involving aviation fuel consumption are relatively fixed, there is less needed to make complex cost decisions. When discussing the fuel cost management process, the cost decision is merged into the cost forecast, and the cost management process is designed with "cost forecast-cost control-cost accounting-cost analysis-cost assessment" as the content. As far as the cost of aviation fuel cost management is concerned, this process is mainly used in aviation fuel consumption management.

From the aspect of improving the level of airline operation management, taking strict control of aviation fuel consumption as the starting point, I conducted an in-depth analysis of the specific methods and procedures for further reducing aviation fuel costs and pointed out the current deficiencies in domestic airlines' aviation fuel cost management. (Zhang, Huang, XU, & Zhou, 2013) At the same time, it points out that aviation fuel consumption

is divided into two different factors: flighted time and fuel consumption per hour. From the perspective of reducing aviation fuel consumption and protecting the natural living environment. From the perspective of reducing aviation fuel consumption and protecting the natural living environment, it shows that aviation companies should take environmental protection as their responsibility. Improve aircraft manufacturing technology and enterprise operation and management level, use non-polluting equipment such as ground equipment to replace airborne APU, and reduce aviation fuel consumption (Moorman, 2008). The research and analysis of aviation enterprises' operational strategy pointed out the influence of aviation fuel price on aviation enterprises' operation and management level (Zia, 2014). Research shows that there is a corresponding quantitative relationship between aviation fuel prices and corporate shipping needs. Aviation companies should strictly control aviation fuel prices, and based on improving their shipping capabilities, formulate corporate operating strategies that conform to the law of development.

2.4 Activity-based costing theory

In 1988, Kaplan and Cooper put forward the basic concept of activity-based costing after much research, analysis, and practical demonstration (Zhu, 2005). The core of this method is "products consume operations, and operations consume resources." However, the concept of activity-based costing has not been defined and explained in detail. Activity-based costing is essentially a method of cost accounting and cost control that takes operations as an essential basis. This view emphasizes the specific application of activity-based costing, analyzes the key to cost accounting and control, and uses operations as a critical basis. (Hu, 2004). Activity-based costing is a cost control method that characterizes operations, resource consumption, and cost-driving factors as core, clues, and media, respectively. (Wang, Yu, & Qu, 2007). First, according to certain resource driving factors, the resources consumed by the enterprise's various operations are confirmed and measured. Then, referring to the driving factors, the operation cost is refined and reasonably allocated to products or services. This view discusses the specific process of activity-based costing in detail but only analyzes the role of activity-based costing in the costing process. Costing is an essential component of cost management and control. Therefore, activity-based costing can also be directly applied to cost management and control. Through years of development and improvement, the content of activity-based costing has been dramatically improved and enriched and is widely used in cost management. It is advocated to control costs in the process of cost accounting. Its main content includes three aspects:

1. Operating cost calculation
2. Operating analysis
3. Operating evaluation and improvement. The primary purpose is to reduce costs.

According to the application of activity-based costing in airline cost management and control, the specific application of activity-based costing is analyzed in depth in the civil aviation industry, and then particular cases are selected to expand the discussion. The

main content includes two aspects, one is cost calculation, and the other is cost control (Lv, 2002). She explored some relevant conditions used in the civil aviation industry. This viewpoint explores the applicability of activity-based costing from the overall perspective of the air transport industry. Regarding the study of analyzing the costing process of airlines with the aid of activity-based costing (Sun & Zhu, 2008). They pointed out that the activity-based costing method can more reasonably allocate the indirect costs incurred in the production of civil aviation transportation and help solve the problem of aviation The company's difficulty in pricing. This view affirmed the improvement of cost accounting by activity-based costing.

2.5 Risk management theory

In September 2004, COSO released the Enterprise Risk Management I Integration Framework (hereinafter referred to as "the Framework"), which enriched the content of internal control, and subsequently was widely accepted as an authoritative norm in countries around the world. The framework recognizes that The Framework recognizes that each enterprise should establish its own management framework based on its own risk management practices and integrate resources. The framework is based on the risk management practices of each company and the integration of resources.

COSO considers risk as "the probability that an event will occur and negatively affect the achievement of objectives." Risk emphasizes the uncertainty that arises in production and management, and risk management is the management of the various types of uncertainty that exist and may arise.

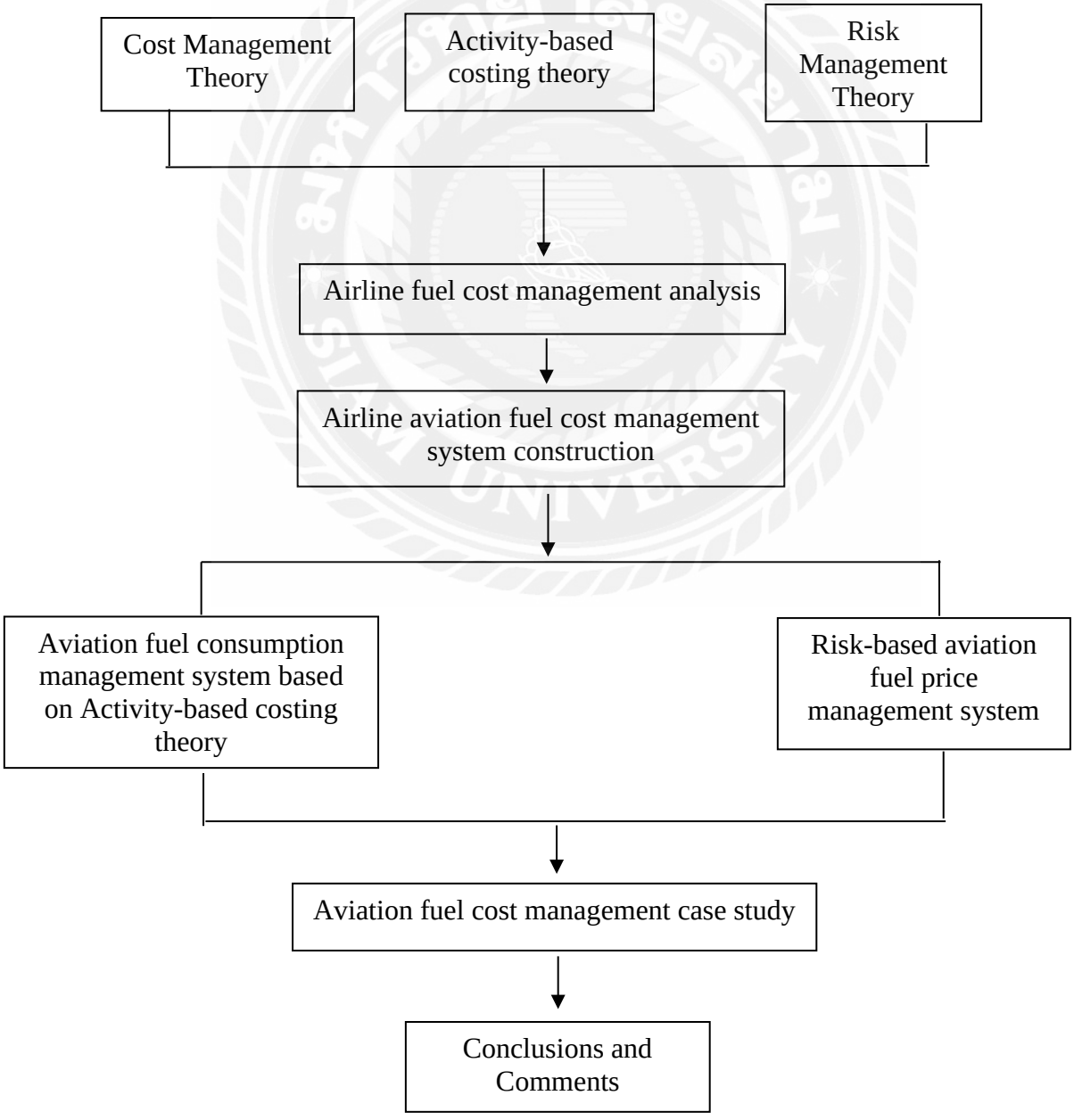
The COSO Committee's "Risk Management Integration Framework" stipulates that the content of risk management is integrated into eight elements: roles and responsibilities, information communication, goal setting, internal environment, event identification, risk assessment, risk response, control, and monitoring. These six factors can be summarized as the specific process of risk management. The first step is to set goals, the second step is to identify the project, the third step is to assess the risk, the fourth step is to address the threat, and the fifth step is to control the activity. The sixth step is strict monitoring (Chen, 2018).

Through the research on the relationship between risk management and internal competition, it is believed that there is no essential difference between enterprise management and internal control (Li & Dai, 2013). It is believed that "there is no essential difference between internal control and enterprise risk management, but two different semantic expressions of risk control". COSO's enterprise risk management integration framework is an upgrade to the overall framework of internal control, which shows from the side that the most fundamental purpose of implementing internal control is to control risks.

Focusing on applying risk management in airline cost control, Risk management theory analyzes the severe losses caused by the implementation of aviation fuel hedging by Chinese airlines from multiple dimensions and perspectives (Sun & Liu, 2011). This point of view out that the risk management level of domestic airlines is relatively low. At the same time, further strengthening risk management capabilities provides reasonable and comprehensive suggestions and opinions for the smooth implementation of hedging

trading activities for aviation fuel control. Taking shipping companies as specific analysis objects and using various financial analysis tools to build a good and complete risk management system for shipping companies has dramatically improved the risk management level of aviation companies (Weng, 2014). In-depth analysis of the problems that aviation companies are prone to high risks in the process of introducing foreign capital (Zhao, 2014). He established a sound and reasonable risk management framework and put forward measures to reduce risks on this basis further. Therefore, risk management can be directly applied to the aviation industry, and when combined with the development situation of the aviation industry, a management method with strong pertinence and good implementation effect can be proposed. The critical reason is not due to the factors of hedging itself, but mainly due to errors in the purpose of hedging, and the role of the hedging contract signed by the company has undergone a substantial change.

2.6 Research framework



3. Research Methodology

3.1 Research Methodology

This paper uses documentary method. This paper analyzes the problems and causes of jet fuel cost management in domestic airlines by applying cost management theory, activity-based costing theory and risk management theory. The airline jet fuel cost management system is constructed, including aviation fuel consumption management system and aviation fuel price management system.

Research design: In this study, a documentary method design was used to gain an in-depth understanding of China Eastern Airlines' fuel cost management. A review of relevant literature and industry data collection were used to obtain detailed information and insights to reveal the company's strategies, practices, and challenges in fuel cost management.

Data collection methods: This study employed a variety of data collection methods, including literature research and case analysis. First, a literature review was conducted to collect and analyze academic literature, industry reports, and company documents related to China Eastern Airlines' fuel cost management. Second, the cases of the airline companies were systematically reviewed and the causes of the problems in the cases were analyzed to obtain more data and information. Finally, the analysis results are organized and summarized to form a comprehensive understanding of jet fuel cost management.

Data analysis method: For the literature study part, content analysis was used to summarize and summarize the information about fuel cost management of China Eastern Airlines by synthesizing, classifying, and interpreting the literature materials. For the research data, the method of thematic analysis was adopted to Repeated comparison and meticulously analyze of the data, extract key ideas and themes, and conduct comparative and comprehensive analysis.

Research quality control: To ensure the quality and reliability of the study, various quality control measures were adopted. First, a mechanism for reflection and discussion among researchers was established to ensure consistency and accuracy on the data. Second, professional research tools and techniques, such as literature management software, were used to ensure the integrity and traceability of the data. In addition, timely documentation and feedback on problems that arise during the research process, and necessary corrections and improvements are made.

Selection of case samples: As a member of the SkyTeam alliance, China Eastern Airlines' route network reaches 1,036 destinations in 170 countries and regions worldwide, serving more than 130 million passengers worldwide each year, and its passenger traffic ranks among the top ten in the world. At the same time, it has been among the top 50 "Most Valuable Chinese Brands" for seven consecutive years. As a representative company among Chinese aviation companies, China Eastern Airlines is in an operating environment that many other airlines are facing or will face. Therefore, China Eastern Airlines was selected as the research object.

Normative research method: Explain the theories of activity-based costing, risk management theory, etc., and analyze and summarize the status quo of airline

management to improve aviation fuel cost management.

Data Sources:(1) The company's annual report, power of attorney, analyst report, industry official data, international association data.

(2) Learning through actual investigations and consulting related documents and materials while referring to the research results of domestic and foreign experts and scholars.

(3) Through the observation method, relevant personnel discussion method, and investigation method.

3.2 Secondary Data

In qualitative research, the use of secondary data (also known as existing data or secondary data) has the following advantages:

Provide rich data sources: Secondary data can come from multiple sources, such as public databases, internal corporate data, social media, etc., which can provide rich market information and consumer behavior data.

Enhances research reliability: By using secondary data from multiple data sources, researchers can conduct cross-validation of data, increasing the reliability and accuracy of research results. Long-term data tracking: Some secondary data may have a long-term time span, allowing researchers to observe and analyze a phenomenon or trend over time. Such data can help researchers understand patterns and trends of change and reveal deeper insights.

Diversity and multidimensionality: Secondary data comes from a wide range of sources and can cover different fields, topics, and types of data. This allows researchers to understand and interpret research questions from different perspectives and dimensions, enriching the diversity of research.

Data reliability and stability: Secondary data are usually validated and verified through a validation process after preliminary data collection and collation and have a high level of data reliability and stability. This can increase the credibility and reproducibility of the research results.

Despite the above-mentioned advantages of secondary data, researchers should also be aware of their limitations, such as data availability and applicability, limitations in data quality, and limitations and incompleteness of data. （Smith & Johnson, 2018). Therefore, when using secondary data, researchers need to carefully evaluate the data sources and take care to discuss data limitations and biases appropriately when analyzing and interpreting the results.

4. Finding and Conclusion

4.1 Analysis of external factors and causes of high fuel costs

The literature review method and Figure 2.1 revealed that the direct external factor causing the high fuel cost is the increase of aviation kerosene price.

The main reasons for the increase in aviation kerosene prices are:

1. Crude oil extraction was adjusted downward by the epidemic. After the epidemic, oil production was lowered. With the widespread promotion of vaccination, the world's economies began to recover, but the production of oil was not raised up suddenly. Production was not enough, and the economic recovery increased demand and had to consume stocks, leading to a continuous decline in oil stocks.

2. World-wide carbon peaking and carbon neutral. The number of reserves will not be able to keep up with the demand, so the price of oil supply exceeds demand. Although it is said that in recent years vigorously develop new energy, but the scope of application of new energy is far less than oil.

3. International oil mainly comes from Russia. Due to the international situation, Russia's oil and gas trade has been subject to Western sanctions, which is the "trigger" for the current surge in oil prices.

Since entering 2022, aviation kerosene market prices have been rising sharply. In March, aviation kerosene market prices once rose to RMB 8,300/ton, up RMB 1,490/ton or 21.88% from the beginning of the year; as of May 25, aviation kerosene market prices were RMB 7,780-7900/ton, compared to RMB 1,682/ton in May 2020 and RMB 4,082/ton in May 2021. 4082 yuan/ton in May 2020 and May 2021, the price of jet fuel has doubled several times in two years.

Chinese jet fuel prices are administratively priced and have the inevitability to be an indirect external factor of high fuel costs.

Located in the supply chain management of airlines are often government departments and large state-owned enterprises, which guide the cost trend of airlines. China's jet fuel prices are mainly determined by the Development and Reform Commission and the General Administration of Civil Aviation, which are uncontrollable. With the convergence with international oil prices, jet fuel prices are exposed to uncontrollable external risks.

Since China is not a major oil producer and has few oil reserves, it is decided that the price of jet fuel in China is shaped to include both ex-factory and sales prices. price and sales price. The ex-factory price, the ex-factory price of jet fuel in China is determined by the State Planning Commission and is a uniform price nationwide. After the ex-factory price is determined, then CNPC and Sinopec CNPC and Sinopec will sell jet fuel to CNOOC. Compared to the global level, our ex-factory price is much higher than the ex-factory price of foreign jet fuel in the same period. Not only that, but it is also even higher than the sales price of foreign jet fuel.

4.2 Analysis the internal factors and causes of high aviation fuel costs

1.Problems of aviation fuel consumption management and analysis of the causes

Incomplete management processes. The airline's consumption management is limited to cost control, focusing on fuel saving management, which is achieved through the effective operation of pilots as a basic means of controlling costs. The fuel saving management work only reflects the one-way flow of information, i.e., how much aviation fuel is consumed in one flight mission. In the upstream of the information, there is a lack of corresponding scientific cost forecast information to compare with, and the cost forecast link is missing; in the downstream of the information, as the accounting information provided by cost accounting is not refined enough, there is a lack of further cost analysis information for comparative analysis, and in the cost analysis link, as the accounting information provided by cost accounting is not sufficiently granular and lacks further cost analysis information for comparative analysis.

Cost accounting is not detailed. The fuel cost information provided by the cost accounting is a general figure, which does not provide a record and response to the fuel consumption status of pre-flight operations, air flight operations, post-flight operations and other stages, and cannot provide a deeper level of fuel information, which cannot provide data support for the refined management of fuel costs.

There is no global planning and system design for aviation fuel consumption management from a systems theory perspective. As an important part of accounting, cost management has a complete system of its own. Cost management should follow accounting and management theory and design a scientific system and process. The airline company should also follow such a rule for consumption management. As the current domestic aviation airlines aviation oil consumption management system is not complete, aviation oil consumption management and fuel saving work almost painted on the same sign, the front-line production department isolated to undertake most of the aviation oil cost consumption management work, and other departments such as the finance department is difficult to establish an organic link to produce interaction, cost management effect is poor.

Cost management methods are missing. The current consumption management relies mainly on engineering theories through flight technology and aircraft design and lacks cost management methods. The finance department is less involved, which makes it difficult to expand aviation fuel consumption management to a deeper degree, making it difficult to achieve refined management and less efficient.

2.Analysis of the problems and causes of aviation fuel price management

The main problem with aviation fuel price management is the lack of strict risk control and the immature use of risk management tools. Most of China's airlines have established a sound internal control system in accordance with SASAC requirements, however, there are still deviations in the risk management work carried out by China Eastern Airlines in relation to aviation oil prices. in response to the risk of aviation oil price fluctuations, China's airlines have adopted hedging instruments, the implementation of which has been unsatisfactory due to deficiencies in the timing and operation of

hedging. in 2008 China Eastern Airlines incurred $6.2 billion due to errors in hedging operations. Hedging has not only failed to reduce aviation oil price risk but has additionally resulted in significant losses. Therefore, China Eastern Airlines should be cautious in implementing aviation fuel hedging instruments and strengthen its risk management of hedging.

Objectively, Chinese airlines are late entrants to the field of aviation oil hedging and are inexperienced, which, coupled with the high risk of the aviation oil hedging market and the fact that counterparties to transaction negotiations have accumulated extensive experience in the financial markets, makes it difficult for Chinese airlines to effectively cope with the risks inherent in hedging instruments. Subjectively, China Eastern Airlines is unskilled in the operation and timing of hedging instruments and is not sufficiently aware of the risk characteristics of different hedging instruments, making it prone to errors in their application. In addition, the airline's systems for information transfer and authorization are also somewhat inadequate, making the management of aviation fuel prices unsystematic.

4.3 Establish the airline fuel cost management system

4.3.1 Aviation fuel consumption management system based on the Activity-based costing theory

1.The main body of aviation fuel consumption management

According to the main functional departments involved in aviation oil consumption management, the main body of aviation oil consumption management is designed as shown in Figure 4-1, and the responsibilities of each body are shown in Table 4-1.

2.The object of aviation fuel consumption management

The object of consumption management is the amount of aviation fuel consumed by an airline in its operations. For ease of presentation, when discussing When discussing aviation fuel consumption management, it is assumed that the price of aviation fuel is constant, and that consumption is then expressed as a specific aviation fuel cost. Using the job cost approach as the primary method, the object of aviation fuel consumption management is the aviation fuel operation. It can be divided into pre-flight ground operations (including flight planning operations, aircraft maintenance operations, aircraft refueling operations, crew boarding operations, on-board item replenishment operations, passenger boarding operations, bridge inspection operations), air flight operations (including takeoff operations, climb operations, cruise operations, landing operations), and post-flight ground operations (including bridge inspection operations, passenger disembarkation operations, crew disembarkation operations, aircraft maintenance operations, and displacement storage operations) according to the different stages of production and operation.

Aviation fuel operation volume refers to the business occurrence related to aviation fuel consumption that can be expressed quantitatively. The aviation fuel consumption comes from the operation of engines in air flight operations and the operation of APUs in

ground operations. The longer the operation time of both types of machines, the more aviation fuel is consumed. Therefore, the amount of aviation fuel operations for air flight operations is the flight time, and the amount of aviation fuel operations for ground operations is the APU running time.

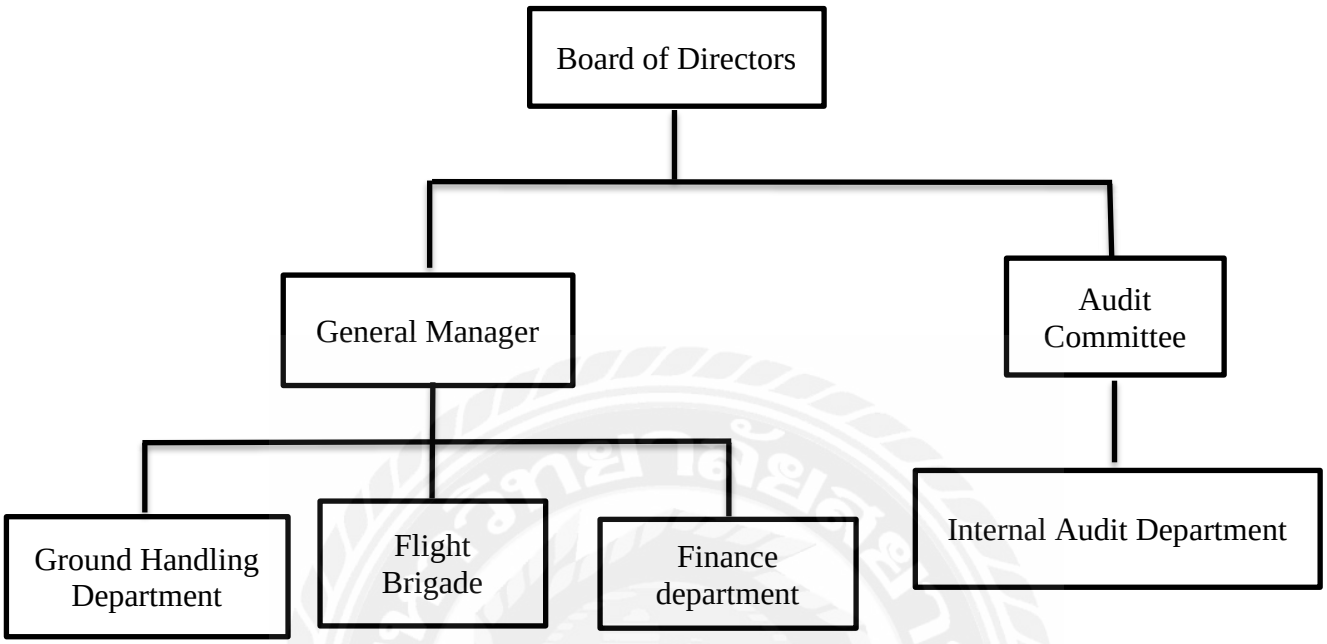


Figure 4.1 Schematic diagram of the main body of aviation fuel consumption management

Levels	Organizational sector	Responsibilities
High Level	Board of Directors	Responsible for the development of major strategies such as fleet planning and flight routes
Middle Level	General Manager	Direct leadership of aviation fuel consumption management and coordination of the work of production, finance, and other departments
	Audit Committee	Monitoring the performance and effectiveness of the relevant departments
Grassroots	Ground maintenance department	Responsible for performing ground operations and recording raw data relating to APU fuel consumption
	Flight Brigade	Perform aerial flight operations and record raw data relating to engine oil consumption
	Finance department	Collate and analyze raw production data from the flight brigade and ground services to forecast, control, account for, analyze, assess, and improve specific cost management components

	Internal Audit department	Check that all departments are following the relevant norms and keeping complete records

Table 4.1 Aviation fuel consumption management subject responsibility table

(1) Flight operations cost analysis

Influencing factors	Description
Flight phase	There are four phases: take-off, climb, cruise and landing There are four phases, with different fuel consumption per unit time in distinct phases. The climbing phase consumes the most fuel per unit time is the highest, followed by the take-off phase, the cruise phase, and the landing phase.
Climbing speed	Climbing phase, the faster you climb, the greater the fuel consumption per unit
Cruising speed	In the cruise phase, the faster the flight speed, the higher the fuel consumption per unit
Cruising altitude	In the cruise phase, the lower the altitude, the higher the fuel consumption per unit
Descent rate	During the landing phase, the faster the descent, the higher the fuel consumption per unit
Trade load	The heavier the load, the higher the fuel consumption per unit
Age of machine	The older the aircraft of the same type, the greater the fuel consumption per unit

Table 4.2 Unit time fuel consumption influence factors table

Flight operations are the process by which an aircraft moves through the air between two locations with the power provided by its engines. The process. The direct driver of aviation fuel consumption is the use of the engine, and the number of operations is the flight time, multiplied by the fuel consumption per unit time. This is multiplied by the amount of fuel consumed per unit of time. Flight time and fuel consumption per unit of time vary during the operation of an aircraft due to flight conditions, aircraft operation, aircraft performance and other factors. As shown in Table 4.2.

Influencing Factors	Description	Increase fuel consumption
Climbing	5 knots greater climbing speed than CI=0	0-0.1%

speed	10 knots greater climbing speed than CI=0	0.1%-0.2%
Optimal height	Low 4000 feet	2.0%
	Low 8,000 feet	6.4%
Cruising speed	0.01 Mach number greater than CI=0 cruising speed	0.2%-0.6%
	0.02 Mach number greater than CI=0 cruising speed	0.7%-2.0%
Descent rate	20 knots greater than CI=0 descent rate	Negligible
	40 knots larger than CI=0 drop	0.1%-0.4%
Landing industry load	Per 1000 lbs.	0.5%

Table 4.3 Boeing 737-300 Fuel Consumption Influencing Factors Table

Data source: "Civil Aviation Fuel Saving Practice and Exploration", edited by Wang Xiaowan

(Note: CI indicates aviation fuel cost index, CI = 0 indicates the most economical flight speed; Mach number is the unit of speed, 1 Mach number indicates that the flight speed is 1 time the speed of sound; knot is the unit of speed, 1 knot = 1 nautical mile per hour)

Xiamen Airlines had used 25 Boeing 737 aircraft as fuel consumption observation objects and derived the fuel mileage loss status of Boeing 737 aircraft in the case of deviation from the optimal flight altitude, and the data is shown in Table 4-4.

Deviation from optimum height (feet)	Percentage of fuel mileage lost	
	Long Range Cruising Speed (LRC)	Mach 0.74
0	0%	0%
Less than 2000	1%-2%	2%
Less than 4000	4%	4%
Less than 8000	11%	11%
Less than 12,000	15%	20%

Table 4.4 Boeing 737 aircraft deviation from the optimal flight altitude fuel mileage loss table

Data source: "Civil Aviation Fuel Saving Practice and Exploration", edited by Wang Xiaowan

(Note: Long-range cruise speed indicates the speed at which the aircraft reaches optimal fuel consumption during the cruise phase)

Through the above analysis, we can see that speed, altitude and operational load constitute the main influencing factors of aviation fuel consumption in air operation, so

pilots should try to strictly follow the best parameters in flight, and at the same time try to reduce the operational load. Therefore, pilots should try to strictly follow the best parameters in flight, and at the same time try to reduce the operational load.

The following factors can make the aircraft time ineffective and longer, summarized in Table 4-5.

Influencing Factors	Factor Description
Route	Bend the route to increase the flight distance and increase the flight time
Spiral	Close to the destination due to control and other factors cannot land in time, forming a hover, increasing the flight time
Operation	Improper pilot handling increases flight time
Aircraft Performance	Different aircraft cruise speed and flight time differences
Weather	Aircraft take more flight time in dangerous weather

Table 4.5 Flight Time Influencing Factors

The length of flight time is an important indicator of the efficiency of flight operations. Increased flight time does not add value to passengers, but rather is an inefficient waste of aviation fuel resources.

(2) Ground operation cost analysis

During the pre and post flight ground operation phase, the aircraft consumes aviation fuel because of the use of APU, and the amount of operation is the time of APU use.

Unlike air flight operations, aviation fuel consumption in the ground operation phase does not result in air displacement and cannot produce value-added operations. Therefore, airlines should avoid using APUs in ground operations and try to use alternative energy sources (such as ground power) to complete ground operations.

3、Management process of aviation fuel consumption

The process of aviation fuel consumption management includes three parts: pre-management, mid-management, and post-management. Pre-management includes cost forecast; mid-management includes cost control; post-management includes cost accounting, cost analysis and cost assessment. Therefore, from the perspective of subdivision, the process of aviation fuel consumption management can be summarized as the process of "forecast - control - accounting - analysis - assessment".

4.3.2 Risk-based Aviation Fuel Price Management System

In this paper, the aviation fuel price management system is a risk management system, consisting of four parts, including management organization, management information, management process and management culture. The management process constitutes the main content of the system, while the remaining three systems form the

basis of the management system at the overall level, in which the management organization clearly defines the subject of risk management in each link, the division of authority within the organization and the management information transfer process; the information system provides the basic raw data for risk, and provides information and data support for determining the risk management object and quantifying risk; the management culture The management culture provides motivational support for risk management.

1.Organization of aviation fuel cost risk management

Based on the existing risk management organization of the airline company, according to the system construction requirements, we can design the aviation fuel cost risk management organization. Based on the existing risk management organization of the airline company, we can design the aviation fuel cost risk management organization according to the system requirements, and the specific department design is shown in Figure 4.3.

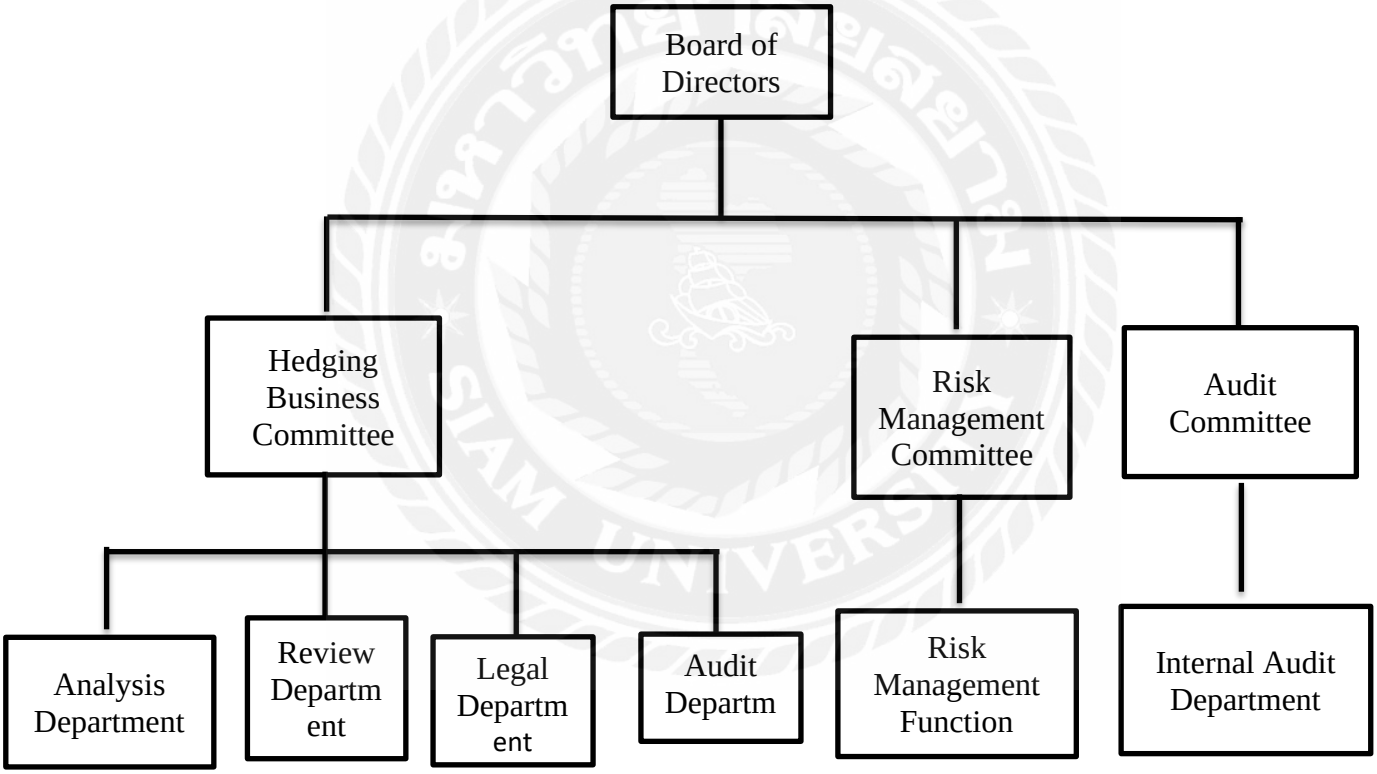


Figure 4.2 Organizational chart of aviation fuel cost risk management

2. Aviation fuel cost risk management information

Enterprise risk managers are at the center of a complex information system that constantly sends information about enterprise risks and uncertainties to risk managers. From a systems theory and information theory perspective from the perspective of systems theory and information theory, the elements of the system interact dynamically with each other and cannot be separated from each other without timely communication of relevant information, and by organizing, refining, and analyzing the information. The system

elements can interact with each other dynamically, and they can communicate with each other in a timely manner and convey more valuable information to the outside by organizing, refining and sublimating the information. Therefore, the aviation fuel price risk management the system has the characteristics of information system.

Specifically for the aviation fuel cost risk management system, the information flow is expressed as the generation and continuous processing and sublimation. Each organization is a provider and receiver of information. Specifically, the middle and senior departments are the providers of strategic information; each organization responsible for the specific operation of hedging is also the recipient of information. The organizations responsible for hedging operations are also the recipients of information, using it as the basis for their own work and receiving feedback to improve their work.

3.The aviation fuel price risk management process

Risk management is a management activity, and the management process should be the main content of the system. In this paper, by comparing Framework" and "Guidelines", combined with the practice of aviation fuel price management, the management process is designed as shown in Table 4.6.

Levels	Organization	Responsibilities
High Level	Board of Directors	Responsible for the development of strategies and major transaction proposals related to aviation fuel price risk management Make final decisions on major transactions
Middle Level	Hedging Committee	Take a leading role in specific hedging work, responsible for the approval and supervision of various hedging operations and the development of annual hedging opportunities. approval and supervision of all hedging activities, formulation of annual hedging opportunities, and submission of annual reports to the General Manager and the Board of Directors. Annual report to the Board of Directors
	Risk Management Committee	Responsible for the review and confirmation of hedging programs
	Audit Committee	Supervision of the performance and effectiveness of the relevant departments
basic level	Analysis Department	Analyze market trends, determine quarterly and annual work plans, and issue risk assessment reports related to hedging
	Trading Department	Follow the market trends, determine the timing of trading, propose trading plans, and carry out specific operations for the relevant transactions

	Legal Department	Assessing the legal risks of transactions and participating in contract negotiations involving legal terms
	Audit Department	Confirm whether the transaction follows the authorization and check whether the transaction contract is compliant and complete
	Review Department	Review transaction terms and related delivery documents, provide audit information, and perform accounting processing
	Risk Management Function	Risk assessment and review of the hedging program, and specific recommendations for modification of high-risk transactions Make specific recommendations for changes to the content of transactions with high risk
	Internal Audit Department	Check and monitor whether the hedging base organization is following internal working guidelines, risk function Check and supervise whether the management department has followed the risk management norms, and conduct Internal accounting and auditing to ensure the compliance of the management operation process related to each department Efficient

Table 4.6 Aviation fuel price risk management organization system responsibility table

4.The aviation oil price risk management culture

The main body of risk management culture construction is the enterprise organization departments at all levels and employees at all levels. Employees at all levels in the work Risk management awareness should be firmly established in the work of employees at all levels, and senior managers should pay attention to make an example of risk culture cultivation.

The object of risk management culture construction is the content that should be included in risk management culture, mainly including risk awareness, integrity awareness, and rule of law awareness. Risk awareness means that the organization and employees are vigilant and cautious in all aspects of daily business, and act in strict accordance with standard procedures to prevent cost wastage caused by deviations in behavior; integrity awareness means that the organization and employees maintain an honest attitude when completing business and transmitting information, do not falsify, and ensure that business is completed in a qualified manner and that the information transmitted is accurate; rule of law awareness means that the organization and employees maintain a strong sense of Awareness of the rule of law means that the organization and employees maintain a strong sense of compliance with the law, so that the execution of each transaction does not violate the provisions of laws and regulations, meets the

compliance requirements of risk management, and prevents external penalties for their own negligence. A risk management culture can dynamically influence other parts of the risk management system. For the organization, a good management culture makes the organization and employees more risk-aware, standardizes daily business operations, and reduces losses due to slackness and negligence; for the information system, a good management culture improves the quality of information and increases the speed of information transmission and expands the scope of dissemination; for the management process, a good management culture improves the efficiency of process operation and ensures smooth process operation.

The role played by risk management culture is fundamental and can deeply influence all systems of risk management. Strengthening the cultural system is a long process, focusing on long-term daily accumulation and making the culture integrated with the actual management process in practice.

The high proportion of aviation fuel cost: The cost of China Eastern Airlines has been rising steadily in the past three years. The cost of aviation fuel accounts for the most significant proportion, roughly maintaining around 30%. In 2018, it reached 32.89%. The second cost item is employee compensation and flying. The cost of depreciation of delivery is generally maintained at about 17%. The proportion of aviation fuel cost is about 15 percentage points higher than the proportion of employee compensation and depreciation cost of delivery. According to the data, the company's highest operating cost is still the cost of aviation fuel. Therefore, effectively controlling the cost of aviation fuel is one of the company's most important tasks at this stage.

China Eastern Airlines can adopt the Activity-Based Costing to account for and allocate the cost of aviation fuel consumed in each stage, to achieve the purpose of optimizing the way of accounting for aviation fuel. The aviation fuel consumption is mainly reflected in the two stages of ground operation and flight operation. The calculation method of operation costing is calculating the aviation fuel cost of each operation according to the total amount of aviation fuel consumption and aviation fuel price.

5. Recommendation

Strengthen the control of aviation fuel saving: Implementing fuel-saving management and control for aviation fuel can start from three perspectives: setting up fuel-saving organizations, standardizing flight fuel-saving operations, and building fuel-saving pipeline control (Li, 2017). The establishment of a fuel-saving organization is the basis for the company to implement fuel-saving control measures, closely linking various departments together to achieve efficient operation of aviation fuel control. On the premise of ensuring the safe operation of the aircraft, the flight plan is formulated by the flight fuel-saving operation specification and fuel-saving pipe control degree to minimize the cost of aviation fuel consumption and improve the company's aviation fuel cost control efficiency.

1. Set up fuel-saving organizations

As the main body of the fuel-saving organization, the crew department mainly uses the following methods to achieve fuel-saving goals at different stages of the flight: In the take-off phase, the crew department determines the aircraft take-off and refueling according to the aviation fuel policy formulated by the company and the CFP (Computer Flight Plan) (Feng, 2021). During the taxiing phase, the ground equipment is used to replace the airborne APU, which reduces the use of APU and saves fuel consumption; if there is an unexpected situation such as a flight delay on the ground during the taxiing phase, the crew can choose to shut down the car, but if the weather conditions and the load All meet the take-off requirements, the crew should try to reduce the thrust to take off; in the cruise phase of the aircraft, the crew should choose the best cruise altitude at a scientific speed; in the descent and landing phases, the crew should avoid premature descent, And cannot adjust the landing state in advance.

The operation control department can select the best alternate landing site, the best cruise altitude, and the amount of backup fuel based on the optimal route chosen by the aeronautical information department and the actual weather information dispatched by the ground crew. The operation control department can also save the fuel cost of international flights through flight means such as secondary clearance, alternate landing sites, and altitude optimization. While the operations control department monitors the flight status in real time, it also pays attention to the collection of essential data such as the amount of fuel taken off, fuel consumption, and remaining fuel on landing.

In the actual operation of the aircraft, the normal wear or tear of aircraft components will hinder the flight of the aircraft and increase fuel consumption. Normal wear or tear includes, but is not limited to, the following aspects: the paint slips off the fuselage, the fuselage is recessed, the exterior of the fuselage is repaired, the replacement emergency parts are protruding, and so on. At this time, the maintenance department must play its logistical support role to minimize or avoid these unfavorable situations. The maintenance department should pay attention to every aircraft maintenance work. Fuel-saving cannot be accomplished through one major maintenance. It should pay more attention to every minor adjustment and repair in daily work.

2. Standardization of fund management

Air transportation is the main business of China Eastern Airlines. The company's participation in hedging is mainly to reduce the impact of aviation fuel price fluctuations on the company's development so that the company's profitability is always within a specific range and a margin system is adopted. To further improve the efficiency of capital utilization, the company must further strengthen capital management and rationally allocate capital during the process of hedging. The second is to accurately analyze the market's short-term price trends from a technical perspective (Wang, 2020). The third is that in the process of hedging, the company should formulate a reasonable and complete transaction plan based on the actual development. Many speculative behaviors and hedging experiences show that if a clear and reasonable transaction plan is not established, it will not always be invincible in the futures market (Xu, 2018).

3. Establish risk management control system

Setting up a reasonable organizational structure can ensure the normal operation of the value-preserving work. Different enterprises have different goals, strategic choices, and implementation plans for hedging. Depending on the status of the three, the establishment of the organization will also be different (Song, 2016).

Clear division of functions: According to the requirements of the hedge risk management and control system, the various functional positions within the risk management and control team need to maintain relative independence and mutually restrict each other on an independent basis. Among them, the four positions of the trading post, capital allocation post, risk control post, and supervision post are changed. To achieve mutual checks and balances to achieve the purpose of risk supervision and achieve cross-supervision of hedging transactions and risk management and control.

Improve the authorization and approval System: According to the regulations of the aviation fuel hedging risk management and control system, when the company implements the aviation fuel hedging plan, every hedging transaction must be authorized and approved by the risk management organization before it can be implemented. The company should improve its authorization and approval system. First, the futures department submits to the leading group for review and revision of the plan. The leading group discusses the proposed project, and the program can only be approved after evaluation and certification. Then, the leading group submits the margin budget approval form to the general manager's office, which the general manager approves; after the financial department reviews and supports it, the specific budget is allocated to the futures trading department before the department manager can perform the next operation. The department manager needs to approve the value of each hedging transaction by the implementation plan and then hand it over to the trader to implement the specific operation. Suppose an emergency and the value-preserving transaction amount needs to be changed on time. In that case, the futures trading department will first authorize the approval of the actual transaction amount required, and the trader can operate after the license is passed.

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