Research on the Relationship between Capital Structure and Financial Performance of Air Transport Companies Listed on the Shanghai and Shenzhen Stock Exchange of China

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Abstract: This paper studies the relationship between the capital structure and the financial performance of listed companies in the air transportation industry. In the research process, the literature research method is mainly used to analyze and comb the research status at home and abroad; the statistical analysis method is used to study the status quo of the capital structure and financial performance of China's shipping and transportation listed companies. Clarify the characteristics of capital structure and financial performance through status quo research, and analyze the reasons; use regression analysis, factor analysis, and other research methods to establish models and empirically analyze the relationship between capital structure and financial performance of listed companies in China's air transportation industry. The study found that the comprehensive financial performance of air transportation companies listed on the Shanghai and Shenzhen stock exchanges in China are negatively correlated with Short-term debt ratio, Long-term debt ratio, Commercial credit ratio, and Equity balance; and the Shareholding ratio of the largest shareholder CR1, the Shareholding ratio of the top ten shareholders CR10, and Company size are positively correlated. Through the analysis of the relationship between capital structure and financial performance, it can provide a basis for adjusting the capital structure of air transport companies. Optimize the financing order of the air transportation industry and reduce the debt ratio.

Keywords: *Capital structure, the financial performance, China's air transportation industry, financial performance, equity structure, debt structure*

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INTRODUCTION

Background

The development of China's air transport industry is playing an increasingly important role in the process of the world's air transport industry. As of May 2019, the "China Civil Aviation Development Statistical Bulletin" issued by the Civil Aviation Administration of China showed that as of the end of 2018, the number of civil aviation transport aircraft on the bookshelf was 3639, of which passenger aircraft accounted for 95.6%, and cargo aircraft accounted for 4.4%. In terms of the route network, as of the end of 2018, China had 4,945 regular flights and 4096 domestic routes, including 100 Hong Kong, Macau, and Taiwan routes and 849 international routes (http://www.caac.gov.cn). In recent years, China's air transport industry has made remarkable achievements, and the total air transport turnover has ranked second in the world.

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Problem Statement

There are problems with the capital structure of China's major listed airlines. The air transportation industry is a capital-intensive industry. For airlines, aircraft and aviation parts are the main fixed assets, which account for a relatively high proportion of the airline's total assets. Statistics show (http://www.caac.gov.cn) that airline fixed assets (mainly airplanes and aviation parts) account for 63.09% of total assets on average. Such a high asset structure ratio enables the air transport industry to maintain a higher debt ratio than the general industry to a certain extent.

China's air transport industry is an emerging pillar industry that has only developed in the past 20 years. Due to the influence of market interest rates, bank loans are used to make airlines have higher requirements for operating conditions and creditworthiness when raising funds. This puts airlines facing greater financial and capital risks.

The air transport industry is a relatively special position in China. Initially, it existed in the form of state holdings and foreign cooperation. The phenomenon of the single shareholder in state-controlled listed companies is more serious. In non-state-controlled listed air transportation companies, the largest shareholder is usually the company's controlling shareholder, and the proportion of total shares is also high. Therefore, the equity concentration of listed companies in the air transport industry is still high. This can easily lead to the self-interest of decision-makers, which will have a negative impact on the company's performance.

Therefore, the problems faced by airlines are mainly in two aspects: First, the debt is too high, and the interest burden is heavy. The second is the high degree of equity concentration and the unreasonable equity structure. These risks and pressures will have a negative impact on airlines. Therefore, how to optimize the capital structure and adjust financial performance indicators in this economic environment is the main issue studied in this article.

Significance of the Study

This article can provide an important basis for shareholders to make investment decisions. Company performance can largely reflect the company's value. The conclusion of this article can help shareholders predict the future development trend of the company, participate in company decision-making, and optimize resource allocation.

It can also help operators of air transport companies, control debt ratios, optimize financing order, and increase the shares of senior management. Reasonable control of state-owned shares, mutual restraint and mutual supervision among shareholders, rational allocation of resources, and play an incentive role in equity.

Objectives

The research objectives are shown as follows:

1. Study the relationship between the capital structure and financial performance of air transportation companies listed on the Shanghai and Shenzhen stock exchanges.

2. Study the relationship between equity structure and financial performance of Air transportation companies listed on the Shanghai and Shenzhen Stock Exchanges.

3. Study the relationship between debt structure and financial performance of Air transportation companies listed on the Shanghai and Shenzhen Stock Exchanges.

LITERATURE REVIEW

Financial Performance Theory

Financial performance is whether the corporate strategy and its implementation and execution are contributing to the final operating performance. Financial performance is mainly reflected in four aspects, namely, profitability, operating ability, debt solvency, and risk resistance. To evaluate the company's financial performance, scientific methods and specific indicators are needed to make an objective and fair evaluation of the company's production and operation effects and efficiency in a certain period from the above four aspects. The research on performance evaluation has a history of more than 100 years. According to the order of its theoretical appearance, there are roughly four stages. The first stage is the cost evaluation stage, the second stage is the financial evaluation stage, and the third stage is in the value evaluation stage, the fourth stage is the comprehensive evaluation stage.

Capital Structure

The study of capital structure theory began in the early 1950s, starting with the famous MM theory proposed by Modigliani and Miller (1958). Over the next half-century, the study of corporate capital structure has gradually become an important research field of financial management theory. After a long period of debate and evolution, the capital structure theory has been continuously enriched and developed, forming many theoretical factions, and playing a theoretical guiding role in corporate financing behavior.

Corporate capital structure is the proportion of debt capital and equity capital in the company's total capital, which can be expressed by the company's debt-equity ratio. Corporate financing methods are divided into debt, equity, and retained earnings. In this paper, the retained earnings are not considered when studying the capital structure, and only the relationship between the debt structure, equity structure, and financial performance in the capital structure is studied. capital structure is an important indicator that reflects the financial status of an enterprise. Therefore, for an enterprise, a reasonable capital structure can greatly reduce the financing cost of the enterprise and play the role of financial leverage to adjust the enterprise, so that it can obtain a greater capital rate of return.

Research on Capital Structure and Financial Performance

There has been a lot of research on the relationship between capital structure and financial performance, but no unified conclusion has been formed. Some scholars believe that there is a positive correlation between capital structure and financial performance. For example, the American economist Durand (1952) proposed the net income theory in 1952. He believes that under the premise that the cost of debt financing is much lower than the cost of equity financing, the use of debt financing by enterprises can reduce the overall capital cost of the enterprise. The bigger it is, therefore, debt financing can effectively optimize the capital structure of the enterprise and increase the company's efficiency.

According to the signal transmission theory proposed by Western financial scientist Ross (1977), the state of corporate capital structure can pass relevant information to potential investors, and debt financing can send a signal to the outside that the company's asset quality is good, that is, the higher the asset-liability ratio, The higher the enterprise value, the positive correlation between the capital structure and company performance.

Berger (2002) used simultaneous equations to test the impact of capital structure on corporate profitability. The results show that companies can reduce the agency cost of external equity and improve the company through debt limitation or incentivizing managers to manage shareholders' interests. business performance.

Chuanxian (2011) Based on the existing capital structure theory, combined with financial related theories, based on an examination of the situation before and after the equity refinancing of private listed companies in China, an empirical analysis of the private equity refinancing in 2007 Qualitative and quantitative analysis of the company's basic financial data revealed that under a certain level of debt, through financial leverage, the asset-liability ratio of private listed companies' equity refinancing was positively correlated with operating performance.

Masulis (1980) the research found that stock price and financial leverage, debt level, and financial performance are all positively correlated.

L. Ling and Geng-Yan (2010) used the 38 companies listed on the SME board in 2004 as research samples and conducted empirical research on the total sample and the sample data of the SME board listed companies before and after listing. Through a descriptive statistical analysis of the capital structure and profitability of the company before and after listing, the article concludes that the profitability of the company will continue to decrease as the level of the asset-liability ratio decreases. At the same time, the results of empirical research show that, whether for the total sample or the sample data before and after listing, the company's profitability is positively related to the level of the asset-liability ratio, and an increase in the asset-liability ratio can significantly improve the company's profitability, thus Improve company performance.

Some scholars believe that there is a negative correlation between capital structure and financial performance. For example, Titman and Wessel (1988) used 469 manufacturing companies in the United States as a sample and used a linear structure model for analysis. The research results show that as the debt ratio increases, the profitability of enterprises gradually decreases.

Zhengfei and Yu. (1998) used 35 listed companies in the Shanghai Stock Exchange as the research sample and used multiple linear regression analysis methods. The research conclusion was that under the condition of controlling industry factors, the capital structure of companies in different industries has significant differences; Asset size, guarantee value, growth, and other factors have no significant correlation with the capital structure; capital structure,

long-term debt ratio, and the company's profitability have a significant negative correlation.

Myers and Majluf (1984) proposed a financing priority based on asymmetric information. The theory is that when a company faces new refinancing needs, the company's financing order is internal financing, debt financing, and equity financing. The company's high-profit return will lead to a lower financial leverage ratio, and there is a negative correlation between profitability and book value financial leverage ratio.

Rajan and Zingales (1995) selected representative companies from seven western developed countries as a research sample to conduct an empirical study on the relationship between corporate capital structure and profitability. The company's capital structure is affected by the characteristics of the company between different countries. The size of the company will affect the relationship between profitability and capital structure, and the capital structure and profitability have a negative correlation.

Liu, Jiang, and Lu (2003) used the relevant theories of industrial economics to test the relationship between the company's capital structure and its competitive strategy in the product market. The results show that there is a negative correlation between the company's operating performance level and the capital structure, while the company's capital structure is affected by the intensity of competition in the product market where it is located, and the two have a positive correlation.

Jianshang (2009) used Shenzhen and Shanghai-listed companies from 2005 to 2007 as the research object and used the Pearson correlation coefficient analysis method to conduct an empirical analysis of the correlation between capital structure and company performance. The results show that there is an insignificant negative correlation between capital structure and company performance; the correlation coefficient has not changed much in the past three years. This shows that the asset-liability structure of listed companies in China has a reverse change relationship with corporate performance, debt has not played its positive role, and this phenomenon has not changed in recent years.

Some scholars believe that there is no correlation between capital structure and financial performance. For example, Ronald (1983) used American companies as a sample to conduct an empirical analysis of the relationship between the capital structure and the value of the company. The empirical results show that only when the company's debt level is between 23% and 45%, the debt ratio generates a Positive impact, and once the debt level deviates from this interval, there is no correlation with the company's operating performance.

Hall and Liebman (1998) studied the impact of long-term and short-term debt ratios on profitability and found that there was a negative correlation between short-term debt ratios and corporate profitability, while long-term debt ratios and profitability were not directly related.

Ying and Shiyin (2006) used 39 listed companies in Anhui Province as a sample to establish a panel data model to study the relationship between capital structure and company performance. The results show that the relationship between the capital structure and performance shows an inverted "U" shape on the graph, that is, the two are positively correlated before reaching the critical point, and the two are negatively correlated after passing the critical point. At the tipping point, the company has realized value.

Ying and Shiyin (2006) based on the practice of state-owned holding companies in Liaoning Province, analyzed the impact of capital structure on company performance from an empirical perspective, verified their correlation, and concluded that when 0 < total liabilities/total assets When < 40%, capital structure, and company performance show a positive correlation; when total debt/total assets > 40%, company performance, and capital structure show a negative correlation.

Research on the Influencing Factors of Capital Structure

Scott Jr (1972) conducted a cross-section analysis of companies in diverse industries and found that the capital structure of companies in the same industry was gathered ostensibly. Consider industry classification as a factor related to the capital structure. It is believed that the average debt ratio will change with different industries due to the changes in asset risks, asset types, and external capital requirements.

Collins and Sekely (1983) studied the debt levels of multinational corporations and found that subsidiaries with headquarters in different countries have obvious differences in capital structure. The conclusion of this empirical study supports the national effect view of capital structure. It is believed that this effect may come from the differences between financial institutions and markets, or different countries' attitudes towards risk.

Genxiang and Pingfang (1999) took companies listed on the Shanghai Stock Exchange as the research object, selected 180 companies listed before 1995 as a sample, and conducted research by referring to the financial data of

these companies. These three factors are positively related to profitability and negatively related to the two factors of growth and the company's non-liability tax exemption.

Genfu, Lin-jiang, and Shi-yan (2000) selected data of listed companies in the stock market (only issued A shares before 1995) from 1996 to 1999 selected 15 related indicators to conduct research. It was found that the capital structure of enterprises was affected by the equity structure the impact is great, and the capital structure is relatively weakly affected by the financial status of the enterprise.

Scholars such as Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001) conducted a comparative study of the factors affecting the capital structure of 10 developing countries such as India, Pakistan, and South Korea. Some country-level factors influence the capital structure.

Xixi and Yifeng (2002) used the determinants of capital structure as the theoretical support and conducted research on 221 industrial companies in Shanghai from 1995 to 1997 and found that the ratio of corporate debt was significantly related to its size and profitability. Scale is positively related to the corporate debt ratio, and profitability is also positively related to the corporate debt ratio.

Research on the Relationship between Debt Structure and Financial Performance

Chen, Hexter, and Hu (1993) selected 275 small and medium listed companies in the UK as a sample, and conducted the empirical analysis using the interval data from 1989 to 1993, and reached a similar conclusion to (Burki, 2017; Neminno & Gempes, 2018; Ronald, 1983), that is, the company's operating performance is positively related to the company's debt ratio.

Faccio and Lang (2002) studies the relationship between corporate debt ratios and corporate profits. The results show that whether a company chooses debt financing is related to the type of uncertainty in its oligopoly market. When the demand is uncertain, the company's debt ratio is negatively related to the company's profit. At this time, debt financing should be reduced to reduce profit loss. When the cost is uncertain, the company's profit is directly proportional to the debt ratio. At this time, the company can increase Debt financing to increase profits.

Frank and Goyal (2003) selected U.S. non-financial listed companies as a sample. Using the data from the 1950-2000 interval, after considering and correcting the impact of the lack of data on the research results, empirical research showed that: When the market value reflects, the company's operating performance is inversely proportional to it.

Zhiguo (2008) selected Shandong listed companies for registration on the Shanghai and Shenzhen stock exchanges as a sample, analyzed the financial data of these companies in 2006, and found that the profitability of these companies is negatively related to the asset-liability ratio and long-term equity. Liabilities are positively correlated, and this relationship is basically in line with western theoretical and empirical results.

Zhen (2012) selected the sample to be all A-share listed companies from 2009 to 2010. Empirical analysis obtained the conclusion that the total asset-liability ratio is negatively related to corporate governance performance.

Mateev, Poutziouris, and Ivanov (2013) analyzed panel data from 3175 SMEs from seven countries and found that there was a negative and significant correlation between the asset-liability ratio and profitability.

Xinli and Hongyao (2014) used agricultural listed companies as a research sample and used multiple regression methods to analyze financial data from 2008 to 2011 for 4 years. They concluded that China's agricultural listed companies had large debts, but the debt impact of the performance of listed agricultural companies is benign.

Harvey Pamburai, Chamisa, Abdulla, and Smith (2015) used an ion model to compare the relationship between corporate debt and financial performance of 158 companies listed on the JSE stock exchange and found that the asset-liability ratio had a negative impact on ROA. Companies with more debt.

Songzhi (2015) conducted an empirical study on the relationship between debt financing and company financial performance of A-share listed manufacturing companies from 2010 to 2012 and found that debt financing level was significantly negatively related to financial performance, and grouped according to the nature of property rights. The negative correlation has performed more prominently in state-owned holding companies, further demonstrating that the liabilities cannot give full play to the governance effect.

Research on the Relationship between Equity Structure and Financial Performance

Berle and Means (1932) pointed out in "Modern Companies and Private Property" that the decentralization of equity can easily lead to shareholders 'inadequacy in the process of supervising the operator, which cannot effectively

allocate resources, which in turn affects financial performance and affects shareholders' equity. damage.

Yongxiang and Zuhui (1999) selected 503 A-share listed companies as the research object, took the shareholding ratio of the largest shareholder as the independent variable, and the return on investment as the dependent variable, and used regression analysis to prove that the equity structure is positively related to financial performance.

La Porta, Lopez-de Silanes, Shleifer, and Vishny (1999) believes that proper concentration of equity can promote the effective operation of listed companies, thereby reducing agency costs for management and improving company performance. Different from the previous point of view, Demsetz and Lehn (1985) believes that the equity structure is a result of shareholders' pursuit of shareholder wealth, and it is a decision result. The equity structure does not affect financial performance.

The research by Feng, Han, and Yan (2002) showed that the financial performance, main body of the listed company, and industry distribution of listed companies will have an important impact on the concentration of listed companies' equity.

Limpaphayom and Ngamwutikul (2004) found that the higher the concentration of the company's equity, the worse the company's performance; and the moderate dispersion of equity will help improve the company's performance.

Zuoping (2005) used 673 listed companies listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange as a research sample, referring to financial data from 1998 to 2002, and using empirical analysis to demonstrate that the concentration of equity was significantly negatively related to the level of debt. The country share ratio is negatively related to the debt level, and the manager's shareholding ratio has no significant effect on the capital structure.

Holderness and Sheehan (1988) compare and analyze the financial performance of listed companies with relatively dispersed ownership and companies with a high degree of equity concentration. The analysis results show that there is no systematic correlation between equity structure and financial performance.

Daowei (2009) used 1135 A-share listed companies as a sample to study the relationship between equity structure and financial performance. The study found that the lower the shareholding ratio of the largest shareholder, the better the financial performance. However, Genxiang and Pingfang (1999) studied the home appliance industry and concluded that the proportion of state-owned shares, legal person shares, and outstanding shares had no significant correlation with the value of the company.

Chang (1999) conducted empirical research by constructing relevant models and found that the equity structure and company performance are negatively correlated.

W. Ling (2010) used the data from 2008 and 2009 to conduct a correlation analysis and regression analysis on the equity structure and company performance of 102 small and medium-sized listed companies. The analysis results show that state-owned shares and natural person shares are not related to company performance. A large shareholder's shareholding ratio has a U-shaped relationship with the company's performance, and institutional investor shareholding and equity concentration are positively related to the company's performance.

Guoliang and Jiasheng (2010) calculated and analyzed the Huffing Index, which represents the degree of equity diversification, and pointed out that the diversification of equity can promote financial performance.

Literature Review Summary

By sorting out the literature on the relationship between capital structure and financial performance, the following characteristics can be summarized:

1. Scholars' research conclusions are inconsistent. From the research results of scholars, the relationship between capital structure and company performance is positive and negative, and the relationship between debt structure and equity structure and company performance is positive and negative. The influencing factors of the structure are different. This may be because the samples selected during the empirical study are different, and the data interval is also different. These reasons may lead to different results.

2. The empirical research indicators are inconsistent, and scholars generally use empirical analysis research methods to study the relationship between capital structure and company performance, and most of them use financial performance to reflect company performance. When studying the relationship between debt structure, equity structure and financial performance, the indicators selected to reflect debt structure, equity structure, and financial performance are not uniform, and the indicators are single. Therefore, they cannot fully reflect the relationship between debt structure, equity structure, and financial performance relationship.
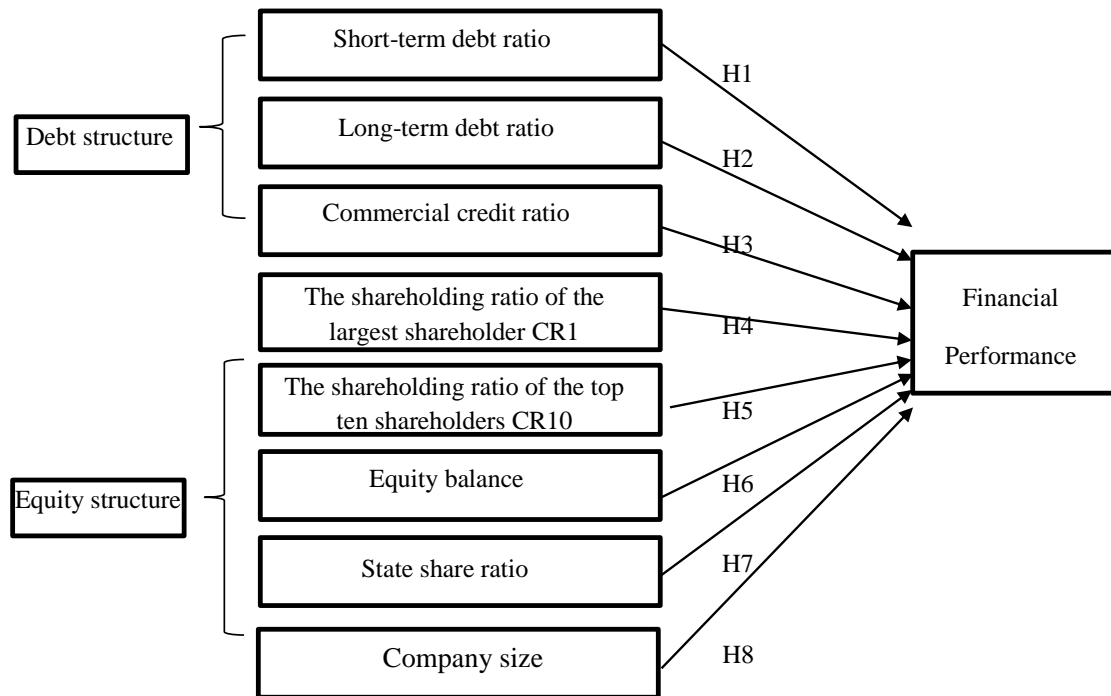
Conceptual Framework

Figure 1 *Conceptual Framework*

Hypothesis

Impact of debt financing on financial performance:

H1: *The short-term debt ratio of listed companies in the air transport industry is positively related to their financial performance.*

H2: *The long-term debt ratio of listed companies in the air transport industry is negatively correlated with financial performance.*

H3: *There is a positive correlation between the commercial credit ratio of listed companies in the air transport industry and their financial performance.*

Impact of equity financing on financial performance:

H4: *The shareholding of the largest shareholder has a positive correlation with the financial performance of listed companies in China's air transport industry.*

H5: *The shareholding ratio of the top ten shareholders of listed companies in China's air transport industry has a positive correlation with the company's financial performance.*

H6: *Equity balance of air transport listed companies is positively correlated with financial performance.*

H7: *The proportion of state shares in air transport listed companies is negatively correlated with financial performance.*

H8: *Company size in air transport listed companies is positively correlated with financial performance.*

MATERIAL AND METHODS

Population and Sample

    Air transportation is a mode of passenger and cargo transportation using an aircraft as a means of transport under the conditions of an airline and an airport. The air transport industry is an asset-heavy industry with high barriers to entry. The air transport industry has formed a natural monopoly during its development and the overall concentration of the industry is high. Considering the different Shanghai and Shenzhen stock market indexes, different parameters selected, and different calculation methods, this article only selects companies listed on the A-share market of the

Shanghai & Shenzhen Stock Exchange as the research sample. The industry concept stocks serve as a reference for the sample selection. In the selection process, the following criteria are selected for selection:

First, the companies with data incompleteness, absolute return on equity, and an asset-liability ratio greater than 1 in the past four years will have abnormal data from these companies that will affect the overall effect of the sample.

Second, excluding listed companies with Special treatment (ST) and Particular Transfer (PT) marks, such companies have suffered losses for years, and the authenticity of the quality of the accounting information they disclose needs to be considered, so they are excluded.

Based on the above criteria, 11 listed companies in the air transportation industry were finally identified as the research samples, and the financial statements for ten consecutive years from 2010 to 2019 were used as data sources to build the capital structure and financial performance database of China's air transportation listed companies.

Table 1 *AIR TRANSPORTATION FIRMS LISTED ON SHANGHAI & SHENZHEN STOCK EXCHANGES*

NO	Code	Firm Full Name	Firm's Short Name	Listed	Time Stock Market
1	601111	Air China Limited	Air China	2006-08-18	Shanghai
2	600029	China Southern Airlines Company Limited	CHINA SOUTH AIR	2003-07-25	Shanghai
3	600115	China Eastern Airlines Corporation Limited	CEA	1997-11-05	Shanghai
4	600221	Hainan Airlines Holding Company Limited	HNA	1999-11-25	Shanghai
5	601021	Spring Airlines Co., Ltd.	SA	2015-01-21	Shanghai
6	603885	JUNEYAO AIRLINES Co., Ltd	JUNEYAOAIR	2015-05-27	Shanghai
7	600004	Guangzhou Baiyun International Airport Co.,ltd.	gbiac	2003-04-28	Shanghai
8	600009	Shanghai International Airport Co., Ltd.	SIA	1998-02-18	Shanghai
9	600897	Xiamen International Airport Co., Ltd	XIAC	1996-05-31	Shanghai
10	000089	SHENZHEN AIRPORT CO., LTD	szairport	1998-04-20	Shenzhen
11	002928	China Express Airlines Co., LTD	China Express	2018-03-02	Shenzhen

DATA ANALYSIS

Factor Analysis

The factor analysis method is a multivariate statistical analysis method that uses the linear relationship between data, thereby simplifying information processing in a way of dimensionality reduction. Factor analysis is a mathematical-statistical method, but because it can simplify the processing of complex original information through calculations, the purpose of quantitative evaluation of financial performance can be achieved by constructing a financial indicator system. Therefore, this analysis method is widely used in financial performance evaluation research in different industries.

Today, the use of factor analysis to evaluate the financial performance of enterprises has become a recognized method of analysis, and the main body of research covers listed companies in all industries.

This paper selects the comprehensive financial performance (F) of the listed companies in the Chinese air transport industry as the financial indicator. The 12 indicators that reflect profitability, operating ability, solvency, and growth ability are calculated by factor analysis and used as explained. variable.

The main process of performance evaluation by factor analysis method is to group several closely related variables into the same category and integrate each category of variables into one factor so that there is a low correlation between different categories of variables. Avoid the bias of traditional performance evaluation methods due to subjective factors. Genxiang and Pingfang (1999) Its mathematical model is:

$$\begin{cases} x_1 = a_{11}F_1 + a_{12}F_m + \cdots + a_{1m}F_m + a_1\varepsilon_1 \\ x_2 = a_{21}F_1 + a_{22}F_2 + \cdots + a_{2m}F_m + a_2\varepsilon_2 \\ \qquad \cdots\cdots\cdots \\ x_p = a_{p1}F_1 + a_{p2}F_2 + \cdots + a_{pm}F_m + a_p\varepsilon_p \end{cases}$$

The main procedures of the empirical research using the factor analysis method in this paper are as follows: first, use KMO and Bartlett test to test the applicability of the data; second, use principal component analysis to determine the factor variables and explain them; third, perform factor naming; Fourth, calculate factor scores and performance.

Unit-Root Test

To identify the variables that affect the financial performance of Chinese cultural media firms, the quality of the criteria is verified with a unit root test before using the information, because non-stationary factors can affect the behavior and characteristics of the series, leading to spurious regressions. If the variables are non-stationary, the data should be used first to differentiate them. If the first difference is not found at stationary, further differentiation may be required.

Multicollinearity Test

The multicollinearity test will investigate elevated pair smart correlations and easy correlation coefficients, as the multicollinearity level can be indicated. There is no problem of multi-coordination if the relationship between two explicative variables is less than 0.80.

Correlation Model Construction

This article uses a multiple linear regression model to study the relationship between various influencing factors and company performance. The multiple linear regression model can clearly show the impact of each explanatory variable and control variable on the explained variable.

This article only selects companies listed on the Shanghai & Shenzhen Stock Exchange as a research sample to study the impact of capital structure on the company's financial performance. Therefore, the following models are established for the relationship between capital structure and financial performance:

Zhen (2012) The relationship model between debt financing structure, capital structure, and financial performance

$$F = a + b1SD + b2LD + b3CC + b4CR1 + b5CR10 + b7EB + b7SS + b8AS + e$$

Table 2 *VARIABLE ABBREVIATION*

Variable	Specific Indicators	Abbreviation
Dependent variable	Comprehensive Financial Performance (F)	F
Independent variable	Short-term debt ratio	SD
	Long-term debt ratio	LD
	Commercial credit ratio	CC
	The shareholding ratio of the largest shareholder	CR1
	The shareholding ratio of the top ten shareholders	CR10
	Equity balance	EB
	State share ratio	SS
Control variable	Asset size	AS

Among them: a represents a constant term, b1- b9, represents a correlation coefficient, and represents an error term.

When performing linear regression, you need to do a correlation test on the variables of the model to test the correlation between the variables. After the correlation test is passed and the conditions are met, the next operation can be performed. This article uses the person correlation analysis method to measure the correlation between the two variables and obtain the person correlation coefficient.

RESULTS AND DISCUSSION

Unit-Root Test

The results from the Unit Root Test are shown in Table 3.

Table 3 *THE RESULTS OF STATIONARY TEST BY UNIT -ROOT TEST*

Variable	Levin, Lin & Chu t	Prob.	Result
SD	-16.4886	0	Stationary
LD	-122.7978	0	Stationary
CC	-35.3666	0	Stationary
SR1	-263.992	0	Stationary
SR10	-10.8942	0	Stationary
EB	-54.5633	0	Stationary
SS	-101.078	0	Stationary
AS	-15.8249	0	Stationary

Levin, Lin & Chu t* is a method to test panel unit-root. If its result is higher than 0, the data is Non-Stationary. If its result is lower than 0, the data is Stationary. Table 3 shows all variables are less than 0.05 and Levin, Lin & Chu t* is lower than 0, meaning that the SD, LD, CC, CR1, CR10, EB, SS, GR, AS, and F variables value are stationary.

Multicollinearity Test

Test for multicollinearity will study the high pairwise correlations and high simple correlation coefficients because it can indicate the level of multicollinearity. If the correlation between two explanatory variables is less than 0.80, there is no problem of multicollinearity.

Table 4 *THE CORRELATION OF THE INDEPENDENT VARIABLES*

	F	CC	EB	LD	SD	SR1	SR10	SS	AS
F	1								
CC	-0.583898	1							
EB	-0.452676	0.402696	1						
LD	-0.448176	0.366561	0.703702	1					
SD	-0.686275	0.619682	0.528274	0.570253	1				
SR1	0.369662	-0.2966	-0.923507	-0.586091	-0.44613	1			
SR10	-0.464296	0.447663	0.6754	0.637478	0.592845	-0.571236	1		
SS	0.146766	-0.1544	-0.572898	-0.595958	-0.36002	0.607668	-0.22826	1	
AS	-0.461417	0.424599	0.739539	0.653207	0.664021	-0.706391	0.795154	-0.34515	1

Table 4 shows the correlation analysis of the independent variables in the model. It is found that the value of the correlation coefficient does not exceed the limit value set for multicollinearity, and all limit values are less than 0.8. Therefore, there is no multicollinearity problem. All independent variables can be used to run the regression.

Regression Results

Regression Results of Dependent Variable *F*

Table 5 *REGRESSION RESULTS OF F*

Variable	C	SD	LD	CC	SR1	SR10	EB	SS	AS
Coefficient	-29.11441	-7.416844	-4.280575	-3.020953	3.49551	3.418401	-1.482661	-2.172195	1.402941
Std. Error	2.471775	0.506425	0.421162	0.986372	0.844496	0.632157	0.247559	0.434767	0.099907
t-Statistic	-11.77874	-14.64549	-10.16373	-3.062692	4.139165	5.407514	-5.989118	-4.996224	14.04242
Prob.	0***	0***	0***	0.0027***	0.0001***	0***	0***	0***	0***
R-squared									0.970961
F-statistic									78.67328
Prob(F-statistic)									
Durbin-Watson stat									

***: significant at 0.01 level.

**: significant at 0.05 level.

*: significant at 0.10 level

From Table 5, *R*-squared equals 0.970961, the estimated equation can account for the 97.09 percent change in *F* factors. The probability that CC, EB, LD, SD, SS, SR1, SR10, AS, is less than 0.01. which implies CC, EB, LD, SD, SS, SR1, SR10, AS, will be significant at point 0.01

It should be studied to find that the relationship between capital structure and financial performance is not a single positive or negative impact, but should be specific to every factor that affects the capital structure. The overall debt structure has a negative relationship with financial performance, which is consistent with previous conjectures. In the Equity structure, the specific influencing factors are quite different.

CONCLUSION AND RECOMMENDATION

Conclusion

This paper conducts regression analysis of debt structure, equity structure, and corporate financial performance of 11 listed companies in the air transport industry. The debt structure selects three indicators: Short-term debt ratio, Long-term debt ratio, and Commercial credit ratio. Equity The structure selected four indicators: Shareholding ratio of the largest shareholder, Shareholding ratio of the top ten shareholders, Equity balance, and State share ratio and reached the following conclusions:

Table 6 *SUMMARIZE FOR TESTING HYPOTHESIS*

	Variable	Hypothesis	Conclusions	Expectation	Accept/Reject Hypothesis
Debt Structure	Short-term debt ratio	Affect financial performance	Negatively related	Positively related	Reject
	Long-term debt ratio	Affect financial performance	Negatively related	Negatively related	Accept
	Commercial credit ratio	Affect financial performance	Negatively related	Positively related	Reject
Equity Structure	The shareholding ratio of the largest shareholder CR1	Affect financial performance	Positively related	Positively related	Accept
	The shareholding ratio of the top ten shareholders CR10	Affect financial performance	Positively related	Positively related	Accept
	Equity balance	Affect financial performance	Negatively related	Positively related	Reject
	State share ratio	Affect financial performance	Negatively related	Negatively related	Accept
	Company size	Affect financial performance	positively related	Positively related	Accept

According to Table 6, the research on the factors affecting the financial performance of air transportation companies listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange is summarized. It was found that the Short-term debt ratio of the debt structure changes with the positive financial performance, and this hypothesis was rejected. Accept the assumption that the Long-term debt ratio and State share ratio will change in a negative direction with financial performance; accept the assumption that the Shareholding ratio of the top ten shareholders CR10, Company size will change in a positive direction with financial performance. This study accepted the assumption of the Shareholding ratio of the largest shareholder CR1, which has a positive impact on the financial performance of air transportation companies listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange. Rejecting the assumption of Equity balance has a negative impact on financial performance.

Research Recommendations

Suggestions for improving the structure of claims: 1. Strengthen risk management and maintain a moderate debt ratio.

As companies often use financial leverage to play a role, the excessively high debt ratio of listed companies in the air transportation industry may cause financial risks. Therefore, the main way to avoid financial risks is to reduce the debt ratio and control the number of debt funds. Therefore, the company should control the debt-to-asset ratio at a reasonable level to play the positive role of financial leverage and avoid financial risks.

2. Reduce short-term liabilities appropriately and improve corporate debt structure. Although the short-term debt ratio, Long-term debt ratio, and commercial credit ratio are all negatively correlated with financial performance, they are compared to the short-term debt ratio, Long-term debt ratio, and commercial credit ratio. This kind of debt has a small impact on financial performance and can adjust the corporate debt structure, comprehensively use multiple financing forms, and reduce short-term debt.

Suggestions for improving the ownership structure: 1. Increase the shareholding ratio of major shareholders.

From the perspective of the financial performance of the Shareholding ratio of the largest shareholder (CR1) and the Shareholding ratio of the top ten shareholders (CR10), air transport companies listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange should increase their shareholder's shareholding ratio, such a high concentration of equity is conducive to the financial performance of the air transport company, can effectively generate management incentives, reduce agency costs, and increase corporate value.

2. Conversion and circulation of state shares and legal person shares

The liquidity of state-owned shares is not strong, which means that most of the state-owned shares will hinder the development of enterprises, resulting in the slow development of functions such as capital market, company control rights, and manager market, and it is difficult to play the positive role of external governance mechanisms. Therefore, it is necessary to realize the conversion and circulation of state-owned shares and legal person shares as soon as possible while maintaining the basic stability of the stock market.

Limitations and Further Research

This article also has certain limitations. First of all, the financial index data selected in this article are all derived from the annual report data disclosed by the company. Although the certified public accountant needs to audit the annual report of the listed company, the guarantee provided by the certified public accountant is limited to reasonable guarantees, so it is impossible to 100% guarantee the truthfulness of the data disclosed in the annual report Sex and integrity. Secondly, the selection and revision of the index system in this article are combined with the author's analysis and judgment on the characteristics of the air transport industry, which is subjective. Different evaluation subjects may have different opinions on the selection and revision of the index. To a certain extent in terms of research conclusions, they are not unique. Finally, because changes in the external environment will affect the corporate performance evaluation system, the conclusions of this article are based on the historical data disclosed in the annual reports of listed companies in the air transport industry, and therefore reflect the past financial performance. The company's future financial performance development trend forms an accurate forecast.

In follow-up research, attention should be paid to changes in the external environment, and the evaluation system should be appropriately adjusted to adapt to the new development trend of the industry.

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