Pisco Med Publishing

Original Research Article

The Influencing Factors on Profitability of Hong Kong Airport

Shuyue Geng

Hefei Science and Technology College,Hefei, Anhui Province 230000

Abstract: Hong Kong is an internationally renowned tourist city, so exploring profitability of the airport is also of great significance for effectively developing the economy of Hong Kong. This paper collects relevant influencing factors and profit. To avoid nonlinear correlation and higher independent coefficient, logarithmic and factor analysis are used. So the variables are divided into factor1 includes most variables and factor2 includes aircraft movements for specific purpose. A regression model is established for the two factors. It can be seen from the model that the all variables selected in the paper have a positive impact on airport profitability.
Keywords: Hong Kong Airport; Profitability; Regression; Influence

1. Introduction

1.1 Background

Airport economy has many successful cases in the world scope, but its theoretical research development lags in practice. The airport economic zone has become the main window for regional economic development due to convenient traffic conditions[1]. It will also break through the boundaries of local regions and form industries in a larger regional space. For Hong Kong, the airport can be seriously in need because it is directly connected with foreign cities. This development trend makes the airport economic zone a dominant link with the global industrial chain.

1.2 Data description

This article sets profit of Hong Kong airport as dependent variable, explores the influencing factors that affect profitability of Hong Kong airport. This article collects the profit(Tens of millions of Hong Kong dollars)， the crude price, the exchange rate, the number of passengers, the cargo throughput(Tonne), the unloading and loading volume(Tonne), the aircraft movements for passengers, cargo and specific purpose from Hong Kong airport annual report and CSMAR database. The data for related factors are from 1998-2018.

2. Literature review

Existing scholars usually take the profitability of airlines as the research object, and most of them are theoretical analysis[2], and explore the influencing factors of profitability from the economic level. Foreign scholars Forsyth P analyzed from the existing airport facilities and routes that the US route has a lower fare and a wider distribution[3], but it is fully profitable because the US aviation industry has been developing for a long time, and air travel has become popular. However, Hong Kong has different national conditions and analysis are more convincing from a data perspective.

3. Model

3.1 Theoretical review

This function is a linear combination of one or more model parameters called regression coefficients. Given a random sample $(Y_i, X_{i1}, \ldots, X_{ip}), i = 1, \ldots, n$, there are other influence factors besides the effect of X among the relationship between an dependent variable for linear regression model Y_i and independent variables $X_{i1}, \ldots, X_{ip}$. We add an error term (which is also a random variable) to capture the effect to Y_i of anything but $X_{i1}, \ldots, X_{ip}$. Therefore, a multivariable linear regression model is expressed in the following form: $Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_p X_{ip} + \varepsilon_i, \quad i = 1, \ldots, n.$

3.2 Model building

First put all independent variables into regression model, the output shows the VIF is large, it is easy to find the variables exist strong collinearity. When try to eliminate the collinearity so delete some variables, the remaining variables do not pass the coefficient tests.By observing the scatter plot, it can be seen that there exists a non-linear relationship between some variables (the crude price, exchange rate, aircraft movements) and profit. In order to linearize them, the correlation coefficient of the logarithm of profit is calculated.According to the result of Pearson correlation, we find some independent variables also exist the stronger correlation. To avoid collinear effect, this article uses factor analysis to classify these variables.

doi: 10.18282/l-e.v10i7.3011

Table1. Total variance explained for factor analysis

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.771	77.715	77.715	7.771	77.715	77.715
2	1.013	10.128	87.842	1.013	10.128	87.842
3	.703	7.028	94.870			
4	.234	2.340	97.210			
5	.127	1.272	98.482			
6	.078	.781	99.264			
7	.052	.523	99.787			
8	.021	.206	99.993			
9	.001	.007	100.000			
10	4.991E-6	4.991E-5	100.000			

Extraction Method: Principal Component Analysis.

From this table, it is obviously that when we extract two components, 87.842% variance is been explained. So this article decides to extract two components to explain the whole variables. According to the result of factor analysis, the first component includes most variables, the crude price, exchange rate, passengers, cargo throughput, unloading and loading volume, aircraft movements, aircraft movements for passengers and cargo[5]. So we name these nine variables as Factor1 as the whole. Considering the crude price, it will change with the exchange rate. When the exchange rate changes, it means the global economy is in a state of flux and Crude oil prices will change with the trend. With the change in crude oil prices, airport equipment maintenance and various operating expenses, passenger throughput and cargo throughput will gradually change. Another component has strong relationship with aircraft movements for specific purpose. In the following modeling process, we name it as Factor2 mainly contains the aircraft movements for specific purpose variable. This variable is known by querying the Hong Kong annual report and not related with commercial use. Therefore, the trend of change of this variable is not completely similar with other variables and will be affected by other factors such as political situation[6]. According to the component matrix, the equation for factors:

$$Factor1 = 0.883*X1+0.770*X2+0.894*X3+0.931*X4+0.934*X5+0.918*X6+0.986*X7+0.960*X8+0.969*X9+0.430*X10$$

$$Factor2 = -0.171*X1+0.404*X2+0.155*X3-0.235*X4-0.205*X5-0.243*X6+0.030*X7+0.073*X8-0.107*X9+0.789*X10$$

According to the regression model, the factor1 and factor2 are positively correlated with profit. Considering the composition of component, it means all the ten variables have positive effect on the profit of Hong Kong airport. This model basically is consistent with economic experience and conforms to the previous conjecture.

4. Conclusion

This paper explores the relationship between airport profitability and various influencing factors by establishing a regression model. It is found that crude oil price, exchange rate, the number of passengers, cargo throughput and number of aircraft movements will have different positive effects on airport profitability. In addition to this, the profitability of the airport will also be affected by various major environmental factors such as economic politics. In order to improve the Hong Kong economy, the government needs to vigorously support the construction of the airport.

References:

[1] C. Muñoz, J. Cordoba and I. Sarmiento, "Airport choice model in multiple airport regions", Journal of Airline and Airport Management, vol. 7, no. 1, p. 1, 2017. Available: 10.3926/jairm.62.

[2] A. Graham and P. Morrell, Airport finance and investment in the global economy. .

[3] O. Diaz Olariaga and J. Ávila Álvarez, "Evolution of the airport and air transport industry in Colombia and it's impact on the economy", Journal of Airline and Airport Management, vol. 5, no. 1, 2015. Available: 10.3926/jairm.43.

[4] L. Wang, "Research on the Impact of E-commerce to Logistics Economy: An Empirical Analysis based on Zhengzhou Airport Logistics", International Journal of Security and Its Applications, vol. 9, no. 10, pp. 275-286, 2015. Available: 10.14257/ijsia.2015.9.10.25.

[5] B. Loo, "Passengers' airport choice within multi-airport regions (MARs): some insights from a stated preference survey at Hong Kong International Airport", Journal of Transport Geography, vol. 16, no. 2, pp. 117-125, 2008. Available: 10.1016/j.jtrangeo.2007.05.003.

[6] G. Heilbronn, Essays on aviation and travel law in Hong Kong. Hong Kong: Hong Kong University Press, 1990.