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A Performance Prediction to Shanghai Disneyland Resort: Multiple Regression Analysis Based on the Experiences of Hong Kong Disneyland

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Abstract: **Prediction on a newly-established tourist site or commercial property is usually difficult due to the lack of historical data and the problem of finding a similar comparison counterpart. Shanghai Disneyland Resort is openning soon and has attracted huge attention from general public, however question remains as to the performance of it. This article starts from the historical data of Hong Kong Disneyland, by exerting multiple regression analysis with conparison method, then derives highly fitting models on telling the vistor consumption amount and visior flow volume which are the key factors for our further prediction on the income statement of Shnghai Disneyland Resort. To give extented application, our disccusion of Shanghai Disneyland Resort provides a new train of thought of prediciting a newly-established tourist site or commercial property.**

Keywords: Multiple regression analysis; Conparison method; Shanghai Disneyland resort; Prediction

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1. Introduction

One of the most hit events in China this year is the upcoming opening of the Shanghai Disneyland Resort which is an almost completed theme resort by Walt Disney Parks and Resorts, planned to formally open to tourists all over the world on 16 June 2016. To meet Chinese Fans's expectation and excitement, the pre-sale tickets has been able to booked in advance since March 28th and so far the tickets of July has been sold out. Besides Disney lovers based in China, fans from various counties has paid much attention on the paradise of entertainment and we should recognize that it is the first Disney park in mainland China and the second in Greater China, after Hong Kong Disneyland.

Drawn much attention on, the Shanghai Disneyland Resort itself does has investment value to focus on for the reason politically, economically, t echnologically and geographically. According to the plan of the project released by the official Walt Disneyland Resort, phase 1 of the resort will feature a Disneyland-style park, Shanghai Disneyland, an entertainment district, two themed hotels, recreational facilities, a lake and associated parking and transportation hubs. Other upcoming phases will include the development of two additional theme parks at the resort. As for the location, the resort will cover 963 acres in Pu dong district, that is to say, the newly shanghai Disneyland in mainland China is approximately 3 times the size of Hong Kong Disneyland, at a construction cost of CN¥ 24,500,000,000 for the new theme park and an additional CN¥ 4,500,000,000 to build other sites of the resort, totaling CN¥ 34,000,000. Approximatively 43% of the resort is owned by Walt Disney and the remaining 57% by Shanghai Shendi Group, a joint venture of three companies owned by the Shanghai government. The resort was approved by the Chinese government on November 4, 2009.

Though public generally think highly of the profitability prospect of Shanghai Disneyland, still some critics show solicitude for the development of the resort in a long-run based on the perennial loss of HongKong Disneyland.

Similar to Shanghai Disneyland, Hong Kong Disneyland was born with hope and expectation from public once. However, the following operation performance made both investors and Disney lovers frustrated.

Seen from the excerpts of income statement from 2005 to 2012 above, Hong Kong Disneyland continuously suffer a great loss in 8 years due to several arguments referred to external and internal reasons. One of the most essential one is from the Disneyland itself-the area available for entertainment is not in accordance with visitors's original images and the lack of facilities lead to the decrease in popularities whereas the guide services in English were generally regard as unreasonable and untenable since most of its visitors were from mainland China where English was not a common language for majority. As for the external background, anti-mainland visitors campaign was always connected to bad performance in revenue of Hong Kong Disneyland as the visitors from mainland China composed half of its potential customers. At the same time, the unfair operating model did drove

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the Hong Kong local government in an awkward situation since over 90% investment of the whole projects merely results in the 57% ownership which lead critics to suspect that the Disneyland was just a trap well designed by Americans.

Thus there is enough reason to query the feasibility of Shanghai Disneyland Resort on account of the experience and lesson from Hong Kong Disneyland especially for the reason that both the two resorts are aimed at a similar tourists group and has similar cultural and political environment even though diverse in details.

That is mostly the reason why we choose this project to study and we are pleased to give a comparable analysis of in predicted performance of Shanghai Disneyland in the following 3 years based on the data of Hong Kong Disneyland.

2. Analysis

2.1. Regression analysis on the of consumption level per capita Shanghai Disneyland Resort

In this section, we consider that GDP per capita has a lot to do with consumption level per capita, so we have to study the relationship between the level of consumption and GDP per capita in Hong Kong.

The statistical data of Hong Kong Disneyland business revenue and total number of tourist can be obtained in outline of Hong Kong Disney financial statements From 2009 to 2015, and then we use total revenue divided by the number of tourist to get Consumption per capita in Hong Kong Disneyland . According to the CBN , the international tourists accounted for only 20% of the Hong Kong Disneyland total tourists, in order to simplify the calculation, this paper will use China's per capita GDP on behalf of Hong Kong Disneyland visitors' per capita GDP.

By analysis the distribution relationship between the consumption per capita of Hong Kong Disneyland and GDP per capita of 2008-2015 years, we can know that the two are in accordance with power function relation and the regression equation which can be obtained using regression analysis between consumption per capita and per capita GDP is Model estimation results are shown in Table 1.According to the GDP per capita for each province in China and Provincial market share of to Shanghai Disneyland Resort in "A case study of Shanghai Disneyland Resort on spatial structure forecast for proposed scenic spot market: Modification and its application of gravity model", we can estimate China's GDP per capita with regional factors and estimate the consumption per capita .

According to the result of Goldman Sachs estimates, China's GDP growth is expected to be 6.4% in 2016, 6.1% in 2017, 5.8% in 2018. We can weighted the GDP per capita of next three years according to the market share and take the GDP into function (1.1), we can estimate the consumption per capita of the next three years.(Table.1)

Table 1 Consumption per capita in Shanghai Disneyland Resort in 2016, 2017, 2018

Consumption per capita in 2016(yuan)	Consumption per capita in 2017(yuan)	Consumption per capita in 2018(yuan)
675.28	716.48	758.03

2.2. Multiple Regression analysis on the visitor flow volume of Shanghai Disneyland Resort

Before we give projection and analysis on the revenue and cost of Shanghai Disneyland Resort, we need to predict and exam the visitor flow volume of it, hence we can determine whether it is successful or not and what can we do to improve its visitor flow. Due to the lack of historical data of Shanghai Disneyland Resort (for it is a newly established theme park), we are not able to directly predict the visitor flow of the next few years. However, we can refer to the historical data of Hong Kong Disney Land which is much easier to obtain. Hong Kong Disney Land is closely related to the mainland market and shares the mainland market with Shanghai Disneyland Resort together, therefore it has a good reference value for us to derive the visitor flow volume of Shanghai Disneyland Resort.

At present, there are basically three projection model to derive the visitor flow volume of Shanghai Disneyland Resort which are the Penetration Model, the Gravity Model and the Multiple Regression Model. The Penetration Model is comparatively a more subjective model which gives direct prediction of visitor flow volume based on the visiting willingness of each potential visitor by combining the survey on the visitors with the population base and the carryover factor. Due to its subjectivity which may easily be biased, this model is mainly used for interval estimation of visitor flow and visiting willingness. The Gravity Model is an idiomatic model which has been widely applied internationally to derive the possible visitor flow volume. The Multiple Regression Model, by referring to the advantages of the former two models, gives an adjusted projection with consideration of multiple factors which is more reasonable and practical, thus we adopt it as the basic model in our analysis.

Assume Xi represents the attractiveness of Hong Kong in province i, Mi represents the attractiveness of Hong Kong Disney Land in province i, Zi represents the GDP-distance ratio in province i, and Yi represents the visitor flow volume in province i. We give the formula of these parameters below.

Here, we use Baidu Keyword Index to define

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parameter Mi since it can tell us how people in each province care about the Disney Land to a large extent. Parameter Zi considers the GDP per capita and Spherical distance as it defines the travel inclination of visitors from province i.

To derive parameter Mi, Xi, and Zi, we convert the collected data of Hong Kong Disney Land (Table 2) to the following sheet below.

Table 2 Actual Parameter Value of Multiple Regression Model (Hong Kong)

Province	Mi attractiveness of Hong Kong Disney Land	Zi GDP-distance ratio	Xi attractiveness of Hong Kong	Yi visitor flow volume
Shanghai	12.65	836.88	11.94	72.67
Zhejiang	12.28	731.44	3.81	35.22
Jiangsu	12.19	748.89	2.88	31.15
Anhui	8.65	327.06	2.27	14.43
Jiangxi	8.09	504.37	2.07	6.73
Fujian	10.88	1020.03	6.67	38.78
Hubei	10.14	549.28	4.05	34.78
Shandong	10.70	398.01	1.25	14.87
Henan	10.33	281.97	1.59	13.99
Hunan	9.30	648.73	1.41	15.76
Tianjin	9.86	575.25	5.93	19.39
Hebei	9.67	230.71	1.43	9.92
Beijing	14.42	542.13	13.49	78.96
Shanxi	7.72	201.96	1.02	3.18
Liaoning	9.49	280.17	1.84	13.54
Guangdong	29.77	5143.70	12.21	237.32
Shanxi	8.74	337.46	2.03	13.99
Neimenggu	5.40	347.64	0.83	2.22
Jilin	7.53	198.74	3.14	8.58
Chongqing	7.91	474.15	3.14	16.28
Guizhou	5.95	335.22	0.76	3.18
Qinghai	0.84	207.96	0.00	0.00
Guangxi	8.56	587.52	2.56	11.77
Hainan	4.84	923.47	3.28	3.18
Sichuan	9.58	270.74	1.60	19.83
Heilongjiang	8.00	138.43	1.83	6.73
Gansu	4.00	143.47	0.00	0.00
Ningxia	1.58	227.42	2.49	1.33
Yunnan	7.26	244.67	1.25	7.25
Xinjiang	4.09	119.83	1.87	4.96

Note: GDP-distance ratio has been multiplied 10；attractiveness of Hong Kong Disney Land has been multiplied 100；attractiveness of Hong Kong has been multiplied 100；

Source: Baidu Key Word Index; LIU Shaopai, TIAN Jipeng, LU Lin, A case study of Shanghai Disneyland on spatial structure forecast for proposed scenic spot market: Modification and its application of gravity model ;website of Hong Kong tourist office http://www.discoverhongkong.com/

Based on the above clarifications of each parameter, we can then derive our visitor flow volume model in this way.Here, G, a, b, c are unknown coefficients in the model. Derive the natural logarithm of equation (2.1), we then have a linear equation below. In this form, we put the data from aforementioned Excel, and then obtained the coefficients we need through the Multiple Regression Analysis: lnG=-1.4832, a=0.6548, b=1.2005, c=0.1432.. We can see from Table 8, the R square in the regression function is equal to 0.8842, thus it shows the regression results is significant and effective and the fitting degree of our visitor flow model is fairly high.

Finally, our model, in the form of equation (2.1), is as below, Apply our model according to the data we found of Shanghai Disneyland Resort, we then are able to predict the visitor flow volume (Table 3).

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Table 3 Estimated Parameter Value from Multiple Regression Model (Shanghai)

Province	Mi attractiveness of Shanghai Disney Land	Zi GDP-distance ratio	Xi attractiveness of Shanghai	Yi estimated visitor flow volume (10 thousand)
Shanghai	1	3956.71*	161.16	722.18
Zhejiang	12.00	4604.45	37.64	161.49
Jiangsu	14.32	3308.97	53.41	239.49
Anhui	6.31	899.23	35.13	56.45
Jiangxi	3.41	602.80	27.77	21.83
Fujian	4.71	1117.19	9.98	17.99
Hubei	4.70	743.14	9.02	15.85
Shandong	7.82	882.94	5.78	22.33
Henan	6.49	474.40	10.75	24.51
Hunan	3.36	486.40	8.10	9.28
Tianjin	3.41	1132.45	5.27	8.05
Hebei	4.97	407.26	3.07	7.66
Beijing	9.21	1002.64	7.71	33.44
Shanxi	3.18	319.22	8.94	8.74
Liaoning	4.36	549.62	2.35	5.74
Guangdong	9.55	559.60	5.30	25.16
Shanxi	4.11	393.52	3.10	6.12
Neimenggu	2.27	523.85	4.00	3.70
Jilin	2.91	358.79	3.90	4.63
Chongqing	2.67	363.59	5.80	5.44
Guizhou	2.11	196.00	9.72	5.24
Qinghai	0.97	259.71	3.77	1.16
Guangxi	2.25	220.51	8.40	5.25
Hainan	1.55	251.36	4.52	2.27
Sichuan	6.58	222.91	4.49	12.65
Heilongjiang	3.27	234.92	4.10	5.19
Gansu	1.73	152.57	3.46	2.04
Ningxia	1.25	230.11	12.29	3.36
Yunnan	2.31	149.24	4.81	3.55
Xinjiang	1.70	125.11	5.68	2.68
Total				1443.48

Note: *GDP-distance ratio of Shanghai is not able to be calculated directly for its spherical distance is near zero but we can derive it from the average value of comparable province (Jiangsu and Zhejiang) which shares similar GDP per capita and is close to each other geographically.

Table 3 is the projection volume of Shanghai Disney Land, given the parameters we discussed before. Therefore, it is reasonable for us to predict that the average visitor flow volume of Shanghai Disney Land is supposed to be at least 14.4 million annually.

However, certain questions remain. In analysis of our visitor flow volume model, there are some facts that we did not consider, remaining to be improved. We assumed the visitor flow stagnate for the first three years without considering the expanding of Shanghai Disneyland Resort in our model. Data of Hong Kong Disneyland is used to derive our model, without considering market segementation and competition.

3. Cost analysis and predicted income statement

As regard to the predictive cost of the following three years of Shanghai Disneyland Resort, comparison approach is used with the help of historic record and annual report of the Disneyland in Europe and Hong Kong.

Cost is divided into main four categories, which are interest expense, operating expenses and selling, general and administrative cost, depreciation and

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amortization and taxation. The annual interest cost is calculated as following. We can easily find the total interest cost is 851 million.

Table 4 Annual Interest Cost

Unit:(100million)	China	U.S.	Total
Stock	77.52	58.48	136
Liability	163.2	40.8	204
Interest rate	3.99%	4.90%	
Interest	6.51	2.00	8.51

According to the annual report in the period between 2010 and 2015 as followed.

We sum up the operating expenses and selling, general and administrative cost, the result of which is then divided by the total revenue, and as a consequence, the annual percentage is 77%, 77%, 76%, 75%, 73%, 72% respectively. Then, FORECAST formulation of Excel is used to predict the following three years' percentages, reaching 71% in 2016, 70% in 2017 and 68% in 2018, which are compared to that of Shanghai. We multiply the predictive total revenue figured out aforementioned by the percentage generated by similar properties in comparison, through which we obtain the sum of operating, selling, general and administrative expenses.

In terms of depreciation and amortization cost, we refer to the report of HK Disney, from which it can be seen that 5% of total revenue is adopted to calculate this category of cost.

As for the taxation, taxation base is the taxable income with the total tax rate being 16%, as used in HK Disney report. Notice that the tax rate is a comprehensive combination rate, such as value-added taxes and sales taxes. Finally, we get the following result.

Table 5 Annual Income Statement

Year	2016	2017	2018
Average consumption	675.28	716.48	758.03
Total tourists(in million)	14.44	14.44	14.44
Revenue	9751.0432	10345.97	10945.95
Operating and other non-operating cost (in million)	6923.24	7242.18	7443.25
Depreciation and amortization	487.55	517.30	547.30
Operating income	2340.25	2586.49	2955.41

4. Conclusion

In conclusion, the newly-established Shanghai Disneyland Resort owns several unique strengths as followed.

Firstly, positioned as an international metropolis, Shanghai is able to attract tourists from all over the world by combining traditional Chinese and local culture with Disney inherent features, highlighting a characteristic attraction, which distinguishes from Hong Kong, where the mainland tourists never feel a welcoming ambience.

Secondly, locating in the center of Yangtze River Delta enables diverse access to Shanghai from anywhere else. For example, from Beijing or Jinan to Shanghai only takes 5.5 hours and 3 hours respectively. Moreover, it is evident that there are 22 million inhabitants, implying great potential of consumers and again, compared to Hong Kong Disneyland, Shanghai guarantees more convenience since mainland tourists still have to apply for permits to travel Hong Kong.

Thirdly, as for prospective market, Shanghai is located in the middle of mainland China, whose market radiation is very strong. Besides attracting tourists from the Yangtze River Delta and east China area, tourists in north China, northeast China, southwest China and central China will be accumulated as well. The nearest first degree tourism markets to Shanghai Disneyland Resort are mainly in Shanghai and surrounding areas, whose economies are highly developed and per capital GDP is much higher than that in average areas. Meanwhile, the second degree tourism markets represented by Yangtze River Delta and east China, also have good economy performance and large tourist population. With the eastern and western economic development, the radiation effect of high-speed rails become much more obvious. Finally, north China's and northeast China's third degree tourism markets also have good potential.

Lastly, when it comes to policies, on the issue of the development goals, a great amount of researchers believe that Shanghai should be forged as "the world famous tourism city". The primary reason is that the target is more in line with the theme of Shanghai urban tourism and the present situation of tourism in Shanghai. As for the twelfth five-year plan concerning Shanghai tourism, participants' Suggestions mainly include: deepening the reform of the system and mechanism, doing management innovation; completing laws and regulations and improving the standardization of tourism market, which are favorable for tourism of Shanghai.

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