China's regional tourism efficiency: A two-stage double bootstrap data envelopment analysis

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ARTICLE INFO

Keywords:
Tourism sector
Data envelopment analysis
Efficiency
Bootstrap
Truncated regression, China

ABSTRACT

This paper investigates tourism efficiency and its determinants using a two-stage double bootstrap approach for a global panel of 31 Chinese provinces over the period 2008–2013. Bias-corrected data envelopment analysis (DEA) efficiency scores were first calculated by employing the smoothed homogeneous bootstrapped procedure (Simar & Wilson, 2000). They were then regressed on a set of explanatory variables using the double-truncated regression approach. The results show that the tourism efficiency in China was low over the sample period. At the regional level, the average tourism efficiency in the east China was higher than central and west. The results also indicate that trade openness, climate change and intensity of market competition increase tourism efficiency. The study reveals several interesting and useful managerial insights and implications for tourism sector.

1. Introduction

Traditionally, agricultural and manufacturing sectors as well as the inflow of foreign capital have been particularly crucial products for economic development, tourism meanwhile is seen as a promoter of economic growth, consequently attracting relatively limited attention of policy makers. In the 21st century, economic globalization and advances in transportation and communications technology stimulate governments to locate and promote productive sectors to explain macroeconomic problems such as unemployment, inflation, and stagnant growth. Tourism is viewed as an important tool in overcoming these problems through improving the balance of payments and creating income, taxes, hard currency and jobs (Bramwell & Lane, 1993; Choi & Sarakaya, 2006; Dwyer & Forsth, 2008; Lee & Brahmaseree, 2013; Miller, 2001; Tang & Tan, 2015). This sector furthermore creates convergence across countries by transferring income from developed countries to developing ones, consequently reducing regional welfare inequalities.

In China, as elsewhere in the world, tourism is considered an instrument of regional development, enhancement and preservation of heritage. In rural regions, the tourism industry ensures economic growth and integration minority populations within the nation state (Yang et al., 2008; Yang & Wall, 2009; Bao, Chen, & Ma, 2014; Cornet, 2015). In the past two decades, domestic tourism had a continuous annual growth rate of 10% and makes a significant contribution to economic growth at level 4%. According the United Nations World Tourism Organization (UNWTO), 57.6 million foreign visitors entered the country in 2011, generating over $40 billion dollars in revenue.

In China, as one of the most-visited countries in the world. According to the UNTWO Tourism Highlights in the 2014 edition, China was ranked in the fourth position, just behind Spain, United States and France in the first position. The most popular destinations for Chinese tourists include Beijing, Shanghai, Xian, Guilin, Hangzhou, Sanya, Lhasa, Chengdu, Lijiang, Hong Kong, and Macau. In 2020, China becomes the world's most-visited country. Thus, it is necessary to measure and compare the tourism efficiency of different areas in China, which may provide empirical and condensed information for policy makers to improve tourist sector.

Recently, the methods of tourism efficiency measures have been greatly enriched and extended. However, the data envelopment analysis (DEA) approach is considered to be one of the most-used approaches in tourism. This method, proposed by Charnes, Cooper, and Rhodes (1978), is a well-established non-parametric method based on linear programming. The DEA method has the advantages of incorporating multiple inputs and outputs and not assuming a particular functional form which links inputs and outputs. Moreover, basic DEA models are amenable to modification, thus providing sufficient flexibility for adapting the method to different tourism evaluation contexts.

The purpose of this paper is to examine the tourism efficiency and to identify the factors that influence their efficiency based on the panel data of provinces in China from 2008 to 2013. In particular, the main focus of the analysis is to determine if China's regions rely more on tourism for economic growth than regular countries and, if so, whether there is a negative impact related to that level of reliance. Initially, the relationship between tourism development and economic growth will be evaluated for China's regions using an innovative double bootstrap.

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Received 23 May 2015; Received in revised form 28 December 2015; Accepted 12 September 2017

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Please cite this article as: Chaabouni, S., Journal of Destination Marketing & Management (2017), https://doi.org/10.1016/j.jdmm.2017.09.002
The results show that the hotel industry was inefficient with a mean overall efficiency measure of approximately 42%.

The findings indicated that 38 international tourist hotels in Taiwan were relative inefficient with an average operating efficiency score of 87.33%.

The results indicated the existence of diseconomies of scale, except in the case of small companies, with operating revenue of less than 3.7 million euros; these comprised 40% of the companies in the sample. The findings on cost inefficiency show that this is time-variant, that not all lodging companies produce at minimum cost levels and that it decreases over time.

The results show that we can utilize the available outputs of the modified model to easily calculate the efficiencies of business units.

The results point out the important role of the operational environment, particularly the hotel location and the existence of golf facilities, Star rating and owning multiples hotels do not seem to be so relevant.

The results show that the average technical efficiency score is 0.85. They also indicated that historical technical efficiency, international tourism attractiveness, education level of employees and payment level of employees have positive impacts on technical efficiency.

The results showed that the hotel industry in major provinces/municipalities such as Beijing, Tianjin, Shanghai, and Zhejiang was assessed as efficient, whereas hotels in provinces such as Hainan, Heilongjiang, and Liaoning were considered least efficient.

The results showed that the tourism efficiency has been considerably improved over the research period due to the change in technical efficiency.

The results revealed that the urban tourism efficiency of China’s was related to the natural conditions, the economic policies and the tourism capital, and have a score equal to one; 25 hotels that perform efficiently in the occupancy service process; 5 hotels that perform efficiently in the catering service process.

The findings show that some eastern regions such as Beijing and Guangdong are associated with scale inefficiency, while certain western regions such as Ningxia and Qinghai’s hotel sectors appear to operate in a more efficient manner.

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The results indicate that the direction of causality between tourism and economic growth depends on the country group and tourism indicator.

The numbers of overseas Chinese and European tourists have shown significantly negative effects on cost efficiency, while the numbers of Taiwan Nationals, North American, Japanese, and Australian tourists have had significantly positive effects on cost efficiency.

The results reveal that hotels in Taiwan are on average operating at 80% efficiency.

Several studies in the literature apply DEA to determine the tourism efficiency (Anderson, Fish, Xia, & Michello, 1999; Anderson, Fok, & Scott, 2000; Barros & Santos, 2006; Barros et al., 2011; Chiang, Tsai, & Wang, 2004; Hwang & Chang, 2003; Pérez-Rodriguez & Acosta-
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