

Evaluation of Marketing Effect of Tourism Government Microblog based on Data Envelopment Analysis

-- Take China's 34 Provincial Tourism Government Microblogs as an Example

Yalin Zou, Xuan Zhu

School of Tourism, Shanghai Normal University, Shanghai, China

Abstract

In order to explore the marketing effects of tourism and government affairs microblogs in various provincial administrative regions, this study uses data envelopment analysis (DEA) to construct an evaluation index system for microblog marketing effects, and expands the research object to the whole link of the same level and type across the country. Marketing, in-depth analysis of the tourism and government affairs microblog marketing communication effect of each provincial administrative region. The study found that the overall marketing effect of provincial tourism government microblogs is good, concentrated in Hong Kong, Macao, Taiwan, central China, and northeast China, and nearly half of the provincial tourism government microblogs have achieved the best marketing effect. The marketing effect of the tourism government microblog is unilaterally affected by pure technical efficiency or scale efficiency. Compared with pure technical efficiency, it is urgent to improve scale efficiency. There are regional differences in scale efficiency, and the scale efficiency in the eastern coastal areas is higher than that in the inland areas.

Keywords

DEA; Tourism Government Microblog; Microblog Marketing; Marketing Effect Evaluation.

1. Introduction

Compared with traditional tourism websites, Weibo has become the fastest-growing application mode of the Internet in China due to the simplicity, timeliness, and interactivity of its content. The advantage of strong sexuality has become an important way for government departments and tourism enterprises to promote and sell and has strong social and economic value [1].

In April 2011, the Information Center of the National Tourism Administration, together with the tourism bureaus of various provinces and cities, jointly built a tourism government microblog platform. Prospering the cultural tourism market has become an important part of the provincial government's we-media matrix. It has been more than ten years since the construction of tourism government microblog platforms in various provincial administrative regions. In order to evaluate the construction of the official microblog platforms of tourism microblogs in various provinces, this paper uses the data envelopment analysis (DEA) to construct a scientific evaluation index system by sorting out the literature on microblog marketing to analyze the marketing data of each province from the opening of the Weibo account to August 2021 and put forward targeted improvement suggestions on the results presented by the marketing data, so as to improve the marketing effect of the official government tourism Weibo platform of each provincial administrative region.

2. Literature Review

2.1. Weibo Marketing Effect

Weibo marketing refers to how enterprises and other types of organizations publish and share information through Weibo, interact with fans, communicate and feedback information, constantly understand the needs of fans, and achieve the marketing behavior of expected goals [2]. At present, the marketing effect of Weibo can be analyzed from the supply side and the consumer side:

(1) Consumer side: Social media represented by Weibo is not only used as an important communication tool with consumers, but also as an influence on consumers' behaviors including information acquisition, attitude, purchase, post-purchase communication, and product/service evaluation. marketing tool [3]. Under the marketing effect of Weibo, the attitudes of Weibo users towards potential tourism interest areas, the life cycle of tourism news, and changes in tourism policies have changed [4]. Weibo marketing promotes Weibo users to generate consumption behavior, which can further generate economic effects [5-6].

(2) Supply side: Enterprises or other organizations share their evaluations or discussions on brands, products, or services through their own Weibo marketing, or opinion leaders through Weibo channels, which is conducive to establishing online word-of-mouth and promoting brand communication [5-7]. Different content and links in Weibo marketing will have different effects on different aspects of the supply side: the quality of the information in Weibo marketing will have an impact on the image of the destination [2]; marketing content and the number of retweets will help improve the destination Hotel occupancy rate [8]; Weibo attention is positively correlated with the company's stock market turnover, yield, and volatility [9].

To sum up, Weibo marketing has extraordinary marketing effects on both the supply side and the consumer side. As more and more enterprises, governments, informal organizations, etc. have matured in Weibo marketing, it is very urgent to evaluate the effectiveness of Weibo marketing.

2.2. Marketing Effect Evaluation

The evaluation of Weibo's marketing effect in the existing literature mainly focuses on two aspects: the construction of a marketing effect evaluation system and the empirical research of marketing effect. The construction of a marketing effect evaluation system refers to a marketing effect evaluation system for a certain research object, aiming to establish a marketing effect evaluation framework for this type of research object. Liu (2016) proposed to construct a qualitative assessment with government assessment as the main body for minority tourist areas [10]; foreign tourists, residents, and third-party professional institutions as the main body, from three aspects: brand recognition, economic growth, and industrial linkage, On the one hand, a quantitative evaluation system for tourism destination marketing has been established; however, she has not conducted empirical research based on this evaluation system, and the effectiveness and practicability of its evaluation system have yet to be tested. Similarly, Zhou and Xu (2012) established the 5T model of the Weibo marketing effect, but only put forward the perspective of analyzing the Weibo marketing effect, and cannot evaluate and compare the effect of Weibo marketing [7].

On the other hand, scholars have sorted out the indicators to evaluate the marketing effect of Weibo through the literature, extracted the comprehensive measurement index of Weibo marketing effect mainly through factor analysis [11-13], and obtained the key factors affecting the marketing effect of Weibo. At the same time, some scholars have explored the effect of microblog marketing through content analysis [10] and experimental methods [9]. In addition, the research objects in the current empirical research are mainly aimed at the evaluation of a single enterprise microblog account [8], a single enterprise microblog marketing activity [7]

and the overall marketing effect of microblog [9] or the evaluation of the marketing effect of a certain link in microblog [9]. However, no research expands the research object to the whole-link marketing of official microblogs of the same level and type across the country and explores and compares the marketing effects of microblogs in different places. As the fastest-growing marketing form at present, microblog marketing has been adopted and applied by more and more enterprises [8]. In the tourism industry, social media represented by Weibo has become one of the most prominent components of the DMO (Destination Marketing Organization) marketing strategy [14], and each province acts as a separate destination marketing organization, it is Weibo marketing has experienced ten years of development, and its marketing effect must be evaluated effectively.

3. Research Design

3.1. DEA Model Selection and Determination

Since the research content of this paper is to evaluate and compare the marketing effects of Weibo in various provincial administrative regions, the traditional structural equation model, AHP, and other methods cannot quantitatively evaluate the indicators representing marketing effects such as input and output. Theoretical DEA can process the effect evaluation of multiple inputs and outputs at the same time, so as to obtain the "effectiveness" of input and output, and use effectiveness to express the degree of completion of Weibo in the marketing process [15]. In other words, the calculation method of DEA can be used to test the marketing effect of Weibo. At present, there are more than 140 DEA models in the world, but more than 10 models are commonly used in China, including CCR, BCC, and the Malmquist index. This paper adopts the most widely used CCR and BCC models. The comprehensive use of the CCR and BCC models in DEA can comprehensively evaluate the effectiveness of decision-making units from two aspects of technical efficiency and scale efficiency and evaluate the marketing effect of tourism official Weibo platforms.

3.2. DEA Indicator Construction

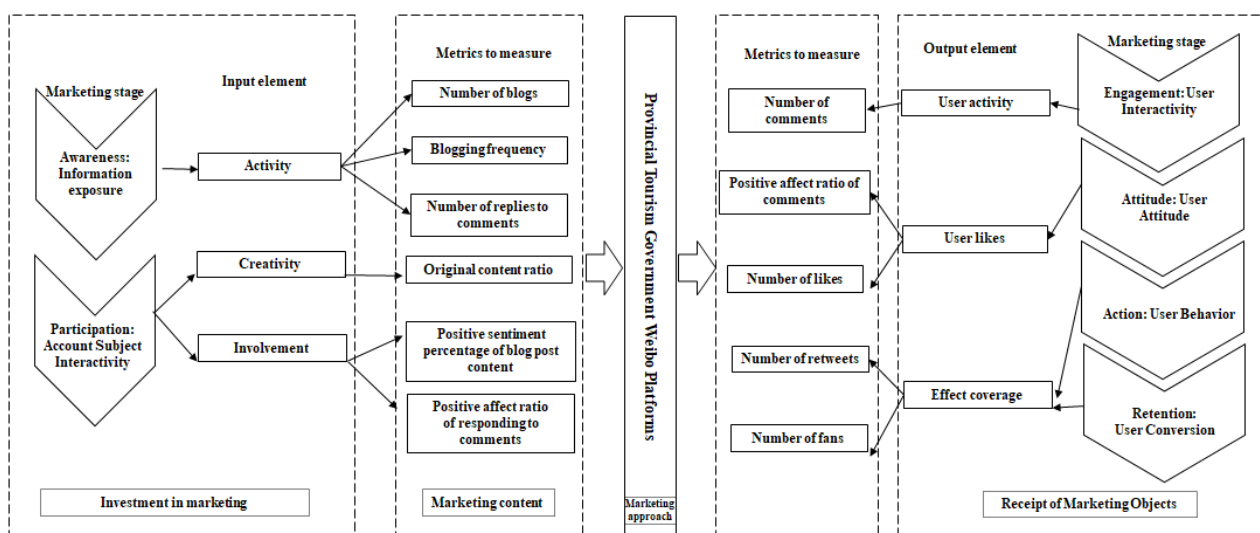


Fig 1. The evaluation index system of tourism microblog marketing effect

As a new situation in the development of social media, the influence of Weibo on users is divided into different stages. Zhao and Zhu (2013) combined the development of microblog media in China and formed a microblog marketing effect AESAR (Awareness attention, Engagement participation, Sentiment attitude, Action, Retention) cyclic evaluation mode [16]. The AESAR

model clearly shows that the effect of Weibo marketing is to attract user attention, encourage user participation, improve user attitude, promote user behavior, and maintain user retention.

Table 1. Input indicator description and literature basis

dimension	specific indicators	Literature basis	Literature sources
Input indicator	Number of blogs	The number of published blog posts is positively related to the influence of Weibo marketing and the effect of information dissemination.	Jin et al., 2011 [17]; Zhang et al., 2019 [18]
	Blogging frequency	The frequency of posting microblog posts affects the effectiveness of microblog marketing.	Wang & Yan, 2014 [12]
	Reply to comments	The number of replies to comments reflects the activity of Weibo marketing subjects in quantity, as well as the interaction with marketing objects in the marketing process.	/
	Original content ratio	Original content affects the amount of interaction and recommendation in the marketing effect of Weibo, and the original government affairs Weibo has a better communication effect and is easier to gain user attention.	Wang & Yuan, 2015 [19]; Yu, 2014 [20]; Liu et al., 2013 [21]
	Positive sentiment percentage of blog post content	The proportion of positive emotions in the content of blog posts indicates the degree of processing and integration of information by marketing subjects in mass media and the degree of emotional investment in the marketing process and affects the marketing effect.	He, 2010 [22]
	Positive affect ratio of responding to comments	The proportion of positive emotions in replying to comments reflects the degree of engagement and interaction between the main accounts of Weibo marketing and their followers in the marketing process from the perspective of quality and emotion.	/

Table 2. Output indicator description and literature basis

dimension	specific indicators	Literature basis	Literature sources
Output indicator	Number of comments	The number of comments directly reflects the interaction, attention, and marketing effect between blog accounts.	Bi et al., 2013 [23]
	Positive affect ratio of comments	The positive sentiment ratio of comments is the attitude and emotional feedback of Weibo fans to the tourism Weibo marketing content of various provincial administrative regions. It reflects the perception of Weibo media audiences on the media content and is the basis for building a city's image and enhancing its popularity and reputation.	He, 2010 [22]
	Number of likes	The number of likes is the interaction and recognition of Weibo users with the content of the blog posts published by the Weibo accounts they follow, and it is the reflection of the amount of interaction and recommendations in the marketing effect of Weibo.	Yu, 2014 [20]
	Number of retweets	The number of retweets reflects the degree of attention and marketing effects of Weibo users. The more retweets, the greater the marketing influence, which is more conducive to establishing a good image.	Bi et al., 2013 [23]; Zhang et al., 2019 [18]
	Number of fans	The number of fans reflects the vitality and content attractiveness of Weibo, as well as the social influence, information coverage, and marketing effect of an account. The effect of Weibo's marketing influence is positively related to the number of fans.	Wang & Yan, 2014 [12]; Wang et al., 2021 [24]; Jin et al., 2011 [17]; Zhang et al., 2019 [18]

The research will take the AESAR model as the framework to determine the input and output of relevant resources in the process of tourism micro-blog marketing such as publicizing and promoting cultural tourism resources, enhancing communication influence, and prospering the tourism market in various provinces and administrative regions content to build the DEA indicator evaluation system.

Therefore, this research will use the AESAR model as the framework, and combine the contents of the urban marketing and Weibo marketing effects of scholars such as Jin in Tables 1 and 2 to construct the DEA index evaluation system.

The above input and output indicators are not only closely combined with the existing research results of many scholars, but also cover the whole link of Weibo marketing, which can effectively evaluate the tourism and government affairs Weibo marketing effect of each provincial administrative region in all aspects.

3.3. Data Sources

DEA requires that the number of decision-making units is greater than or equal to twice the sum of the input and output indicators [17]. In this study, the official tourism microblog marketing account of a provincial administrative region is a decision-making unit. Therefore, the 34 decision-making units in this paper are much more than twice the sum of the number of input-output indicators.

The author is on Sina Weibo official website (<https://microblog.com/u/5871844679/home>) Retrieve the culture and tourism bureaus (Tourism Development Bureau, Transportation and Tourism Bureau) of 34 provincial-level administrative regions, use Weibo authentication to determine whether the Weibo is the official Weibo account of the provincial-level cultural and tourism department of the provincial-level administrative region, and then obtain the official Weibo account of the provincial cultural and tourism department of each province. Input and output data of city and provincial accounts from their creation to August 2021. Among them, the frequency of blogging (articles/day) is calculated by dividing the number of blog posts (articles) by the duration of Weibo's creation (days), and the proportion of original content is obtained by dividing the number of original blog posts by the total number of blog posts. The positive sentiment ratio of blog post content, the positive sentiment ratio of reply comments, and the positive and negative sentiment ratio of comments are the blog post texts, reply comment texts, and user comment texts of tourism microblog accounts in each province are imported into R OST CM 6 software for sentiment analysis to obtain positive sentiment data.

4. The Study Found

Import the data of input indicators and output indicators into DEAP 2.1, and select the VRS (variable return to scale) model to measure the selected 34 provincial tourism government Weibo accounts. The comprehensive technical efficiency of each province and region is graded according to the natural discontinuity, which can be divided into a low grade (< 0.3), medium to low grade ($0.3\sim 0.5$), medium grade ($0.5\sim 0.7$), medium to the high level ($0.7\sim 0.9$), high level ($0.9\sim 1$). Comprehensive technical efficiency is the product of scale efficiency and pure technical efficiency, which is comprehensive to a certain extent. The detailed results are shown in Table 3.

Comprehensive technical efficiency is the comprehensive measurement and evaluation of the resource utilization efficiency and resource allocation ability of the decision-making unit (DMU); pure technical efficiency is the production efficiency affected by management, technology, and other factors, which reflects output determines the minimum input or the ability to obtain the maximum output for a given input; scale efficiency is the production efficiency affected by the production scale of the operating entity, mainly reflecting the gap

between the optimal production scale and the actual production scale. Scale efficiency can be divided into There are three states of decreasing scale efficiency (drs), constant scale efficiency (crs), and increasing scale efficiency (irs) [15].

Table 3. Marketing effects of tourism and government affairs microblogs in various provinces and administrative regions

Area	Province	Comprehensive technical rate TE		pure technical efficiency PTE		Scale efficiency SE		
		Numerical value	Grade	Numerical value	Grade	Numerical value	Grade	increase or decrease
North China	Beijing	1.00	high	1.00	high	1.00	high	-
	Tianjin	0.53	middle	0.60	middle	0.90	high	irs
	Hebei	1.00	high	1.00	high	1.00	high	-
	Shanxi	0.22	low	1.00	high	0.22	low	irs
	Inner Mongolia	0.56	middle	0.58	middle	0.97	high	drs
	Regional mean	0.66	middle	0.84	middle to high level	0.82	middle to high level	/
northeast	Liaoning	1.00	high	1.00	high	1.00	high	-
	Jilin	0.45	middle to low level	0.49	middle to low level	0.90	high	drs
	Heilongjiang	1.00	high	1.00	high	1.00	high	-
	Regional mean	0.82	medium to high level	0.83	middle to high level	0.97	high	/
East China	Shanghai	1.00	high	1.00	high	1.00	high	-
	Jiangsu	0.33	middle to low level	0.34	low	0.99	high	drs
	Zhejiang	0.77	medium to high level	0.87	medium to high level	0.88	middle to high level	irs
	Anhui	0.53	middle to low level	1.00	high	0.53	middle	irs
	Fresh	1.00	high	1.00	high	1.00	high	-
	Jiangxi	0.29	middle to low level	0.29	low	1.00	high	-
	Shandong	1.00	high	1.00	high	1.00	high	-
	Regional mean	0.70	middle to high level	0.79	middle to high level	0.92	high	/
Central China	Henan	1.00	high	1.00	high	1.00	high	-
	Hubei	0.88	middle to high level	1.00	high	0.88	middle to high level	irs
	Hunan	0.60	middle	1.00	high	0.60	middle	irs
	Regional mean	0.83	middle to high level	1.00	high	0.83	middle to high level	/
South China	Guangdong	0.45	middle to low level	0.47	middle to low level	0.95	high	irs
	Guangxi	1.00	high	1.00	high	1.00	high	-
	Hainan	0.39	middle to low level	0.43	middle to low level	0.90	high	drs
	Regional mean	0.61	middle	0.63	middle	0.95	high	/
southwest	Chongqing	0.44	middle to low level	0.77	middle to high level	0.57	middle to low level	irs
	Sichuan	1.00	high	1.00	high	1.00	high	-
	Guizhou	0.76	middle to high level	0.99	high	0.77	middle to high level	irs

	Yunnan	0.23	low	0.24	low	0.95	high	irs
	Tibet	1.00	high	1.00	high	1.00	high	-
	Regional mean	0.68	middle	0.80	middle to high level	0.86	middle to high level	/
northwest	Shaanxi	0.81	middle to high level	0.91	high	0.88	middle to high level	irs
	Gansu	0.24	low	0.38	low	0.63	middle	drs
	Qinghai	1.00	high	1.00	high	1.00	high	-
	Ningxia	0.48	middle to low level	1.00	high	0.48	middle to low level	irs
	Xinjiang	1.00	high	1.00	high	1.00	high	-
	Regional mean	0.71	middle to high level	0.86	middle to high level	0.80	middle to high level	/
Hong Kong, Macao and Taiwan	Hong Kong	1.00	high	1.00	high	1.00	high	-
	Macao	1.00	high	1.00	high	1.00	high	-
	Taiwan	1.00	high	1.00	high	1.00	high	-
	Regional mean	1.00	high	1.00	high	1.00	high	/
Overall average		0.73	middle to high level	0.83	middle to high level	0.88	middle to high level	/

4.1. The Overall Marketing Effect of Tourism Government Affairs in Each Provincial Administrative Region is Good

Overall, the average comprehensive technical rate of tourism and government affairs microblog marketing in 34 provincial administrative regions nationwide is 0.74, the average pure technical efficiency is 0.84, and the average scale efficiency is 0.88. Whether it is pure technical efficiency, scale efficiency, or comprehensive technical efficiency, the average value is more than 0.70, and the overall marketing effect is better.

Beijing and Hebei in North China, Shanghai, Fujian, and Shandong in East China, Liaoning and Heilongjiang in Northeast China, Sichuan and Tibet in Southwest China, Qinghai and Xinjiang in Northwest China, Hong Kong, Macao, and Taiwan in Hong Kong, Macao and Taiwan, and Central China in Henan and Guangxi in southern China, the values of pure technical efficiency, scale efficiency and comprehensive efficiency of these 16 provincial-level administrative regions are all 1.

4.2. There are Obvious Differences in the Marketing Effect of Tourism Government Weibo between Provinces and Regions

The scale efficiency is composed of medium and high grades (0.8~0.9) in the inland areas and high grades (0.9~1) in the eastern coastal areas, and 82.40% of the provinces achieve high and medium-high scale efficiencies. The medium-level scale efficiencies are distributed linearly in Gansu, Chongqing, and Guizhou, and the low- and medium-level scale efficiencies are scattered in Ningxia, Shanxi, and Anhui provinces. Pure technical efficiency is also mainly dominated by medium and high grades (0.8~0.9) and high grades (0.9~1), and provinces with high grades and medium and high grades of pure technical efficiency account for 76.50%, of which high grades are distributed in central China, Hong Kong, and Macao. In the Taiwan region, middle to high-level grades is mainly distributed in Northeast China, North China, and Southwest China. The middle grades, middle-low grades, and low grades are scattered in Jiangsu and Jiangxi Provinces in East China, Guangdong Province in South China, Yunnan Province in Southwest China, Inner Mongolia in North China, Gansu Province in Northwest China, and Jilin Province in Northeast China.

It can be seen that comprehensive technical efficiency is dominated by high-grade and medium-high grades. The areas with comprehensive marketing effects greater than the average value are Hong Kong, Macao and Taiwan, Central China, and Northeast China in descending order. Among them, the pure technical efficiency and scale efficiency of Hong Kong, Macao, and Taiwan reach the highest in good condition.

4.3. The Marketing Effect of Tourism Government Microblogs is Mainly Affected by Pure Technical Efficiency or Scale Efficiency, and Scale Efficiency Needs to be Improved

Except for Hong Kong, Macao, and Taiwan, where the technical and scale efficiencies are higher than the average, only the scale or pure technical efficiency is higher than the average in the other 7 regions, and even the scale efficiency and the pure technical efficiency are both lower than the average. From the perspective of a single indicator of the region, the pure technical efficiency of the four regions of Northeast China, East China, South China, and Southwest China is lower than the average value, and the scale efficiency of the four regions of North China, Central China, Southwest China, and Northwest China is lower than the average value. It is not difficult to see that the reasons for limiting the marketing effect of various regions focus on one aspect of scale or technology. Therefore, most regions should focus on improving one aspect of scale or technology to rapidly improve marketing effects.

The development and improvement of the overall marketing effect of the region require the support of the corresponding provincial administrative regions. At the inter-provincial level, the pure technical efficiency of 38.24% has not reached the optimal state, and 40.06 % of the provinces have not reached the optimal marketing scale efficiency. In addition, among the 17 provinces whose scale efficiency has not reached the best state, the provinces with increasing scale efficiency (irs) reaching the best state account for 70.59%, and the provinces with decreasing scale efficiency (drs) are 29.41 %. Among the 21 provinces whose pure technical efficiency has reached the best state, there are 6 provinces whose scale efficiency has not reached the best state, among which the provinces that need increasing scale efficiency (irs) occupy 100 %. Therefore, compared with pure technical efficiency, there is an urgent need to improve scale efficiency.

5. Conclusion and Discussion

5.1. The Overall Marketing Effect of the Tourism Government Weibo is Good, Mainly in Hong Kong, Macao, Taiwan, Central China, and Northeast China

The average value of each index is more than 0.7, and it is mainly in the middle to high level grades and high grades. Among them, 16 provincial administrative regions such as Beijing and Henan have reached the best state. It can be seen that the comprehensive marketing effect of the 34 provincial-level administrative regions across the country is in a good state, which reflects that under the call and promotion of the information center of the National Tourism Administration (now the Ministry of Culture and Tourism) at that time, the construction of tourism government microblogs in each provincial-level administrative region began in 2011. So far, from nothing to excellent, it is an affirmation of the development of tourism and government microblogs in China's provincial administrative regions in the past ten years. In addition, this study formulates an evaluation plan based on provincial-level tourism government microblogs and draws a conclusion that "compared with other types of government microblogs, tourism government microblogs have the lowest dissemination efficiency" [25], which reflects different types of government microblogs. It reflects that different types of government microblogs need to formulate evaluation plans according to their roles and functions.

The provincial spatial distribution pattern of microblog marketing effect is different from that of Liu and other Chinese tourism microblogs, which are dense in the east and west in the west [26]. The provinces with the best marketing effect are clustered in Hong Kong, Macao and Taiwan, and central China. region and the Northeast. Because the marketing effect of Weibo is directly affected by the informatization construction and tourism development of various provincial administrative regions [27-28]. When the administrative region's informatization construction and tourism development level is higher, the tourism administrative department has the ability and motivation to use the latest tourism information technology to carry out urban marketing. Therefore, the provinces with the best tourism government microblog marketing effect will be concentrated in the major economic and tourism provinces in Hong Kong, Macao and Taiwan, Central China and Northeast China.

5.2. The Marketing Effect of Tourism Government Affairs Microblogs is Unilaterally Affected by Pure Technical Efficiency or Scale Efficiency. Compared with Pure Technical Efficiency, it is Urgent to Improve Scale Efficiency

By comparing the indicators of regions and provinces that are not in the best state, it can be seen that the marketing effect of tourism government microblogs is unilaterally affected by pure technical efficiency or scale efficiency, and compared with pure technical efficiency, scale efficiency needs to be improved urgently. Among the 17 provinces whose scale efficiency has not reached the best state, the current scale of Shanxi, Anhui, Hubei, Hunan, and Ningxia is ineffective, which shows that the scale efficiency is increasing. Scale for optimal marketing.

seven provincial administrative regions with increasing scale efficiency (irs) such as Tianjin, the value of each output index should be increased or decreased correspondingly or increase the value of each output index in order to achieve the best marketing effect.

When improving the scale efficiency of tourism microblog marketing in various provincial administrative regions, the advantages of each province and city should be combined to determine the urban positioning and urban marketing goals, shape characteristic urban products, and improve the input and output factors to achieve the optimal point of production frontier. Achieve effective marketing in the whole process of attracting user attention, encouraging user participation, improving user attitude, promoting user behavior, and protecting user retention.

5.3. There are Differences in Scale Efficiency, The Eastern Coastal Areas are Higher Than the Central and Western Inland Areas

In the scale efficiency, the eastern coastal areas are all high-level scale efficiencies (0.9~1), which are higher than the middle to high-level scale efficiencies (0.8~0.9) in the inland areas. The reason for such regional differences may be that government financial support, informatization foundation, and education level in the eastern coastal areas are better than those in the mainland, while informatization foundation, government financial support, and education level affect the development of government microblogs [29] resulting in regional differences. At the same time, Wu and Yu pointed out that the influence of the US government on Twitter is also related to the level of regional economic development, such as Boston, Seattle, Dallas, and other cities with high economic development levels, the government Twitter influence is higher than other US cities [28].

To carry out marketing with the help of tourism government microblogs, in addition to the foundation of the economy, informatization and education, government attention, policy orientation, attitude, and ability to manage government microblogs all affect the effect of microblog communication [21,27]. Government affairs microblog is the core component of the government affairs media matrix "two microblogs and one shake", and tourism government

affairs microblog is an important way for various provincial administrative regions to publicize and market tourism attractions and carry out urban marketing [3]. In order to improve the pure technical efficiency of tourism government microblog marketing, the system, and management regulations of tourism government microblog marketing should be determined in each provincial administrative region. And build a city marketing management mechanism to provide all-around financial support, talent support, and technical support for the development of government media. At the same time, strengthen urban system marketing cooperation with enterprises and social organizations, give full play to the power of multiple marketing entities, and jointly create urban brand characteristics.

6. Research Deficiencies and Prospects

Han Mei and He Yue pointed out that the evaluation of the Weibo marketing effect is an emerging field, lacking authoritative literature and in-depth research [15]. The framework builds an evaluation framework, but there are also certain limitations. In the construction of indicators, although we have tried our best to build perfect indicators, a certain number of tourism destination videos will be used in the tourism and government affairs microblog marketing of each provincial administrative region. In the construction of indicators, only the text of the video introduction is used, and the video is not included. The content is included in the index system. In the future, it may be considered to carry out in-depth research on the marketing content of video content to establish a more complete index system.

In addition, the data collection and analysis of input indicators and output indicators in this study can be refined to each year in the future, and then use DEA Malmquist index model, to explore the dynamic changes of the marketing effect of each provincial administrative region, and carry out a diachronic study. Finally, this research is mainly aimed at Weibo, which is the most used by Chinese users, mainly in the tourism and government affairs Weibo of various provincial administrative regions in China. In the future, we can try to establish an index system in different countries and different platforms for research to broaden the research scope.

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References

- [1] Z.P. Wang, Y. Liu, M. Chen et al: Evaluation of Marketing Effect in Social Network Environment--Taking Weibo as an Example, *Information Science*, vol.33(2015) No.3, p.118-122.
- [2] C.H. Wang, X. Zhou: Analysis of Marketing Effect of Tourism Enterprises' Weibo, *Business Research*, (2015) No.11, p.69-73.
- [3] M. Jing, M.J. Zhang: The dissemination mechanism, influencing factors and countermeasures of government affairs microblog. *Journal of Shanxi University (Philosophy and Social Sciences Edition)*, vol.44(2021) No.6, p.60-68.
- [4] W.G. Mangold, D.J. Faulds: Social media: The new hybrid element of the promotion mix. *Business Horizons*, vol.52(209) No.4, p.357-365.
- [5] K. Zhou, L.W. Xu: An Analysis of Enterprise Weibo Marketing Strategy and Application Based on the Perspective of 5T Theory--Taking L'Oreal's Weibo Marketing as a Case Study, *Books and Information*, (2021) No.5, p.120-127.

- [6] Z.Z. Chen, S. Lin: An Empirical Study on the Marketing Effect of Enterprise Weibo--Taking Tencent Weibo as an Example, *Modern Communication (Journal of Communication University of China)*, vol.34(2012) No.12, p.88-92.
- [7] J.P. Xue, W.P. Yu, Y.G. Niu: Research on the brand communication effect of e-commerce enterprise Weibo--Take Yixun Weibo as an example, *Soft Science*, vol.27(2013) No.12, p.67-71.
- [8] G. McCartney, P. Cheng, R. Pek: An Examination of Sina Microblog Travel Blogs' Influence on Sentiment towards Hotel Accommodation in Macao, *Journal of China tourism research*, vol.14(2018) No.2, p.146-157.
- [9] M. Dong, X. Xiong, X. Li et al: Microblog Attention and Stock Market Performance: Some Empirical Evidence, *Complexity*, vol.20 (2021) No.18, p.1-8.
- [10] X.L. Liu: Research on the Performance Evaluation Mechanism of the Marketing Effect of Minority Tourism Areas, *Guizhou Ethnic Research*, vol.37(2016) No.5, p.154-158.
- [11] X.Y. Liu, W.X. Zheng: Analysis of the Effect of Corporate Social Media Marketing Communication--Taking Weibo Diffusion Network as an Example [J]. *Journal of Journalism and Communication*, vol.22(2015) No.2, p.89-102.
- [12] L.L. Wang, Q. Yan: Research on the relationship between corporate microblogs and its marketing effect, *Journal of Beijing University of Posts and Telecommunications (Social Science Edition)*, vol.16(2014) No.2, p.6-12.
- [13] C.Z. Wang, F. Wang: Research on Enterprise Weibo Operation Method Based on Factor Analysis, *Heilongjiang Social Sciences*, (2016) No.5, p.68-71.
- [14] S. Hays, S. Page, D.B. D. Buhalis: Social media as a destination marketing tool: its use by national tourism organisations[J]. *Current Issues in Tourism*, (2013) No.4, p.211-239.
- [15] M. Han, Y. He: Evaluation of Marketing Effect of Enterprise Weibo Activities Based on DEA--Taking the Official Weibo of S Enterprises as an Example, *Management Review*, vol. 27(2015) No7., p.137-145.
- [16] A.Q. Zhao, J.H. Zhu: Research on the evaluation of the marketing effect of corporate microblogs, *Jiangsu Business Review*, (2012) No1., p.89-92.
- [17] Y.S. Jin, R. Wang, X.B. Chen: The short-term interaction model of enterprise microblog marketing effect and number of fans, *Management Science*, vol.24 (2011) No.4, p.71-83.
- [18] H. Zhang, Y. Liu, X. Chen: Research on the information dissemination mechanisms of microblog in scale-free networks[J]. *Physica A: Statistical Mechanics and its Applications*, vol.53 (2019) No.2, p.12-18.
- [19] X.G. Wang, Y. Yuan: Research on the Influencing Factors of Weibo Marketing Effect—Taking Media Weibo as an Example, *Modern Intelligence*, vol35. (2015) No.7, p.57-61.
- [20] K. Yu: Analysis of corporate microblog marketing content strategy from the perspective of survey statistics, *China Statistics*, (2014) No.11, p.22-24.
- [21] X.J. Liu, H.X. Wang, X. Xiao, et al: Research on the influencing factors of government affairs microblog based on microblog characteristics, *Journal of Intelligence*, vol.32 (2013) No.12, p.35-41.
- [22] G.P. He: Urban Image Communication: Framework and Strategy, *Modern Communication (Journal of Communication University of China)*, (2010) No.8, p.13-17.
- [23] L.Y. Bi, Z.P. Zhang, W.M. Zuo: Microblog Effect Evaluation Model and Empirical Research Based on Microblog Communication Information Flow, *Journal of Intelligence*, vol.32 (2013) No.7, p.69-73.
- [24] L. Wang, W.J. Zhu, C.Y. Pan, et al: Research on the evaluation method and effect of microblog communication power based on p-index—taking the tourism government official microblog of 34 provinces and municipalities directly under the Central Government as an example, *Information Science*, vol.36 (2018) No.4, p.38-44.
- [25] H. Liu, F.S. Meng, J.J. Sun: Research on the efficiency of government affairs microblog information exchange based on the DEA method, *Information Science*, 2017, 35(6): 9-13.

- [26] D.J. Liu, J. Hu, S.C. Cheng, et al: Spatial distribution pattern and influencing factors of China's tourism microblogs: Taking Sina's tourism microblogs as an example, *Geographical Sciences*, vol.35 (2015) No.6, p.717-724.
- [27] H.Y. Li, W. Tang: How to achieve high-performance implementation of government microblogs—a qualitative comparative analysis based on the perspective of attention, *Journal of the Gansu University of Administration*, (2021) No.2, p.4-14.
- [28] J.C. Wu, W.J. Yu: Research on the influence of government microblogs based on social network analysis, *Information Science*, vol.39 (2021) No.2, p.78-85.
- [29] Z.F. Sun, Y.P. Zheng: Research on the Development and Influencing Factors of Urban Government Microblogs in my country--Based on the Analysis of "Big Data + Small Data" in 228 Cities (2011-2017), *Journal of Public Administration*, vol.18 (2021) No.1, p.77-89.