Analysis of the Impact of COVID-19 Epidemic on Tourism Industry Volatility Under the Background of Big Data

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Abstract
COVID-19 epidemic has caused great impact and profound impact on China's tourism industry in the process of high-quality transformation and development, which is of great significance for promoting anti-epidemic deployment and economic development as a whole. Compared with the SARS period, China's macroeconomic growth momentum and structure have changed significantly, and the contribution rate of the tertiary industry to China's economic growth has risen sharply from 39% in the SARS period in 2003 to 59.4% in 2019. Tourism, as a labor-intensive industry, can effectively absorb surplus labor, which is increasingly supported by governments of various countries under the severe employment situation. This paper analyzes the operational pressure and coping strategies faced by tourism enterprises affected by the epidemic, and through analyzing the changes of tourism economic resilience, it is considered that tourism will maintain high recovery efficiency after COVID-19 epidemic. Only when we have a clear understanding of the volatility of tourism, can we minimize the losses caused by unexpected events.

Keywords
COVID-19, Tourism, Volatility.

1. Introduction
With the rapid development of Internet and Internet of Things, big data is a new product in the information age. With the continuous growth of global data output and the vigorous development of new technologies such as cloud computing, artificial intelligence, blockchain and 5G in recent years, big data has also entered a high-speed development stage, gradually infiltrating and integrating into multiple industries [1]. At the beginning of 2020, an aggressive SARS-CoV-2 hit all parts of China. In the epidemic prevention and control, the Chinese government has widely applied the new generation of innovative technologies such as big data, Internet of Things and cloud computing in epidemic prediction, epidemic tracking and epidemic decision-making [2]. COVID-19 epidemic has caused a systematic negative impact on China's national economic and social development, and the tourism industry has suffered heavy losses. Tourism is one of the most impacted and affected industries by COVID-19 epidemic, and the loss suffered by tourism is not only reflected in the decrease of industry income, but also affects the macroeconomic and social level through its own industrial and social connections [3]. Tourism, as a labor-intensive industry, can effectively absorb surplus labor, which is increasingly supported by governments of various countries under the severe employment situation [4]. At the same time, tourism has a strong pulling force and a great multiplier effect, which can bring huge social, economic and cultural benefits to tourism destinations. The unexpected events that affect travelers' confidence in a destination and disrupt the normal operation of tourism industry are the explanations given by the World Tourism Organization to the crisis [5].
Since China’s reform and opening up, especially since entering the new century, China’s tourism industry has developed rapidly, and many regions have invested huge amounts of money to develop tourism [6]. Since the new media era, China’s tourism has probably gone through several stages, and now it has entered a period characterized by ubiquitous interpersonal interaction [7]. This period did not completely deny the heritage of travel-related ideology in the traditional media era. As an industry with the widest scope, the most cross-regional and cross-industry cooperation and the highest degree of interconnection in the world, tourism is the most responsive to changes in the external environment, and its ability to deal with public events is the most fragile, especially the sudden public events have the most profound impact on the sustainable development of tourism [8]. For irresistible external risks, the tourism system needs to scientifically assess the impact of the epidemic on the market and industry under the unified leadership of the central government, fully draw on the historical experience at home and abroad, and continuously improve the governance system and governance capacity in the tourism field [9]. This paper analyzes the operational pressure and coping strategies faced by tourism enterprises affected by the epidemic, and through analyzing the changes of tourism economic resilience, it is considered that tourism will maintain high recovery efficiency after COVID-19 epidemic. Only when we have a clear understanding of the volatility of tourism, can we minimize the losses caused by unexpected events.

2. Impact of "COVID-19" epidemic on tourism volatility

SARS-CoV-2 is a virus that has never appeared in human body. After infection, the main symptoms are fever, fatigue and dry cough. A few patients are accompanied by nasal congestion, runny nose, sore throat and diarrhea. In severe cases, it causes dyspnea and even death. On January 30th, the World Health Organization announced that SARS-CoV-2 pneumonia was listed as a public health emergency of international concern, which caused a further major blow to China’s inbound and outbound tourism [10]. Tourism is a comprehensive industry that relies on tourism resources and based on tourism facilities and provides tourism services to meet various needs of tourism consumers. The epidemic occurred during the Spring Festival Golden Week, and the severity of the epidemic exceeded that of SARS in all aspects, and the spread of SARS-CoV-2 was more rapid. The incubation period of SARS-CoV-2 is longer, and even asymptomatic infected people appear, which may lead to a longer duration of the epidemic and a longer recovery cycle of the tourism market. During the "COVID-19" epidemic, domestic tourism will be hit by a cliff.

China is the largest outbound travel market country in the world, with a large base and rapid growth. Due to security concerns or the influence of the United States, countries began to restrict the entry of citizens from countries affected by the "COVID-19" epidemic, and adopted entry control, thus causing troubles to the global tourism market. Since WHO declared the "COVID-19" epidemic as a public health emergency, the United States has overreacted to the Chinese epidemic and raised the risk level of traveling to China to the highest level. In today’s post-media information age, diversified tourism consumption demand, tourism industry chain and product structure greatly enrich the connotation and extension of tourism, and the mobility characteristics of tourism in the whole society are more prominent. No matter which link is blocked, it will affect the normal operation of other tourism elements, and then lead to fluctuations in tourism management. In addition to inbound tourism, outbound tourism has also suffered heavy losses.

The employment loss caused by the epidemic can be calculated by dividing the loss scale caused by COVID-19 in the whole economy by the labor productivity of the whole staff:

\[
L = \frac{GDP}{GDP/L}
\] (1)
Among them, L is the number of employees and GDP is the gross domestic product. GDP/L is the gross domestic product per labor, that is, the labor productivity of all employees P:

\[ L = \frac{GDP}{P} \]  

(2)

Using the subscripts \( t_0 \) and \( t_1 \) to denote the two periods before and after the COVID-19 epidemic, the change in the number of jobs before and after the epidemic \( \Delta L \) can be expressed as:

\[ \Delta L = L_{t_1} - L_{t_0} = \frac{GDP_{t_1}}{P_{t_1}} - \frac{GDP_{t_0}}{P_{t_0}} \]  

(3)

Only from the perspective of the quantitative impact of the epidemic on employment, it should be assumed that the economy and other factors affecting employment remain unchanged, and the above formula can be simplified to:

\[ \Delta L = \frac{\Delta GDP}{P_{t_0}} \]  

(4)

Tourism is a kind of leisure activity for people and a way of life that brings spiritual and cultural enjoyment. Because safety is the first factor to be considered in tourism, people may cancel their travel plans for any reason. When the epidemic broke out, people lost their interest in traveling and their travel demand was suppressed. The epidemic will affect not only tourism enterprises, but also the whole pan-tourism industry chain. Taking travel agencies and scenic spots as examples, the business of the Spring Festival Golden Week was basically cleared, and the initial investment basically collapsed. As the Spring Festival orders were refunded, the cash flow of tourism enterprises faced pressure and test. According to the regulations of the Ministry of Human Resources and Social Security, if an enterprise stops production due to the epidemic situation and does not exceed one wage payment cycle, it shall pay wages according to normal working hours [11]. If there is more than one wage payment cycle, the wages of employees may be paid according to the labor provided by the employees and the newly agreed standards of both parties, and shall not be lower than the local minimum wage standard. Proceeding from the overall situation of maintaining social stability, the government hopes that small and medium-sized tourism enterprises can stabilize their posts, not lay off employees or lay off fewer employees, and pay employees during the epidemic period according to state regulations, so that the lives of employees cannot be affected by the epidemic.

3. Countermeasures for tourism industry facing epidemic crisis

3.1. Government

In the face of COVID-19 epidemic, the government has demonstrated its ability to cope with the public health crisis, which is highlighted by putting forward the crisis management idea of fighting the epidemic and focusing on the economy earlier, and issuing a series of policies and measures to support the development of small and medium-sized enterprises affected by the epidemic. In the face of the possible large-scale recovery after the epidemic, in order to avoid vicious competition in the tourism market, disrupt the tourism market and bring secondary crisis to the tourism industry, the government should issue targeted supervision, advocacy policies and laws and regulations in a timely manner. Brand remodeling is an important link in tourism crisis management, which is directly related to the recovery of consumer confidence after the disaster [12]. Whether for China’s competitive position in the international tourism market or for the competitiveness of all localities in the domestic tourism market, it is necessary and urgent for governments at all levels to take the lead and be responsible for carrying out brand marketing activities in appropriate ways after disasters. Internet tourism is different
from traditional tourism in stimulating tourism consumption and satisfying tourism consumption immediately, and it has become an important starting point for keeping customers sticky during the epidemic and recovering industries after the epidemic. Policies and regulations should focus on preventing tourism product price confusion and industrial disputes during tourism recovery after the epidemic. Considering that this crisis is not an economic crisis, but a social and psychological crisis brought by public health emergencies, the government should strengthen the psychological counseling of tourism consumers after the epidemic, stabilize people's hearts and stimulate domestic tourism consumption. In the long run, we should organize the compilation of tourism crisis management plan and make corresponding plans to promote the sustainable development of tourism. In addition to the policy support from the supply side, it is also necessary to provide convenience for the release of tourism demand through measures such as vacation adjustment and flexible working hours. For medical workers and other workers who have been busy in the front line of anti-epidemic during the epidemic period, in addition to the extra work subsidies, they should also arrange to take leave, which is equivalent to adjusting the travel time structure and delaying the release of the Spring Festival holiday tourism demand dividend.

3.2. Enterprises

Tourism enterprises should make preparations as soon as possible, and strive for encouraging policies and subsidies from the government and relevant departments during and after the epidemic. Enterprises should pay close attention to the layout in advance to meet the relevant requirements of the government for assistance. Although the "COVID-19" epidemic poses no small challenge to tourism enterprises, enterprises can also take this opportunity to divest bad businesses, optimize product structure, reconstruct costs, and make careful plans to ensure smooth cash flow, so as to improve their competitiveness during the epidemic period. Accelerating R&D investment and mode innovation has become the choice for many tourism enterprises to spend the cold winter. Among them, intelligent operation, intelligent management, digital products and online marketing have become the direction of upgrading and thinking transformation of many tourism enterprises and tourism projects. Tourism volatility is one of the characteristics of tourism itself, so it is impossible to completely eliminate the impact of tourism volatility [13]. Enterprises also bring their own functions of sales and database marketing from the media, which is of great benefit to the accumulation of private domain traffic and the formation of strategic competitiveness of enterprises. Through continuous content dissemination, low-cost, high-efficiency dissemination and marketing. The change of the allocation ratio of tourism resources among different industries is an important factor that affects the volatility of tourism. Therefore, it is an important way to ease the volatility of tourism by properly allocating resources among different industries.

4. Conclusions

The era of big data has already arrived. In recent years, the output and reserves of data have been increasing year by year both in China and all over the world. Intelligent operation, intelligent management, digital products and online marketing have become the direction of upgrading and thinking transformation of many tourism enterprises and tourism projects. The fluctuation of tourism must be paid enough attention by tourism developers and operators. In 2020, the tourism industry surpassed the SARS period in 2003 in terms of four indicators affecting economic resilience, and the only uncertain factor affecting the recovery prospects of tourism industry lies in the duration of the epidemic and the impact on social economy caused by it. Policies and regulations should focus on preventing tourism product price confusion and industrial disputes during tourism recovery after the epidemic. Tourism enterprises should make preparations as soon as possible, and strive for encouraging policies and subsidies from
the government and relevant departments during and after the epidemic. For irresistible external risks, the tourism system needs to make full use of the historical experience at home and abroad under the unified leadership of the central government, and continuously improve the governance system and governance capacity in the tourism field. When developing tourism resources, the volatility of tourism should be taken into account, so as to avoid blind development of tourism and lack of comprehensive consideration.

References


