Analysis on the Impact of Large-Scale Sports Events on Regional Economy Based on SWOT-PEST Model

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Against the background of surging globalization and accelerating urbanization, more and more cities are choosing to reposition their urban landscape by hosting sports events at different levels to achieve a great leap forward in urban development. Major sporting events can quickly gather various resources from all over the country and even the world for a city, promoting it to become a world-famous city with international influence. In the twenty-first century, more and more Chinese cities are bidding to host important sporting events at different levels, but historical experience shows that hosting slightly important sporting events is a “double-edged sword” and economic benefits are no longer the main reason for a city to host an event. Using the SWOT-PEST model, this paper provides an in-depth analysis of the advantages, disadvantages, opportunities, and challenges of marginally important sporting events of different levels affecting the regional economy from political, economic, social, and technological aspects, so as to understand in detail the economic impact of sporting events.

1. Introduction

As we all know, no matter which city or region is about to undertake slightly important sporting events, it will recarry out the overall planning of stadiums and facilities in the region and improve the service mode of urban transportation and tertiary industry. This feature will bring a large amount of capital flow to the region or city in the short term and bring a large amount of mobile resources with the attraction of sports events. Accordingly, driven by huge external investment, the communication industry, manufacturing industry, and construction industry in the region will also develop synchronously.

In addition, the economic benefits brought by the holding of sports events cannot be underestimated. The venue tickets, accommodation, catering, competition souvenirs, transportation expenses, and so on of sports events are an important part of the development of the retail industry. Therefore, cities or regions with sports events have also driven the net export demand to a great extent. By attracting foreign tourists to watch the games, they have promoted the rapid improvement of the net export demand [1–4]. Since 2008, China has held many large-scale events, which also have an important impact on China’s development as shown in Table 1.

It is necessary to find an effective method for the impact of the above events on regional development and economic construction. SWOT-PEST analysis method is a strategic analysis method that can effectively identify its own strengths and weaknesses, opportunities, and threats [5–7]. Using this method, we can find out their own favorable and unfavorable factors, as well as the opportunities and threats in the external environment, which is of great significance for correctly understanding the impact of slightly important sporting events on the regional economy, developing their strengths and avoiding their weaknesses, and making them develop in a healthy direction. Through Figure 1, we can see the trend of sports events on economic change.

For the SWOT-PEST analysis method, SWOT is mainly manifested as advantages, disadvantages, opportunities, and threats. PEST includes four aspects: politics, economy, society, and technology. SWOT is actually a method to
synthesize and summarize all aspects of the internal and external conditions of the enterprise and then analyze the advantages and disadvantages, opportunities, and threats of the organization.

SWOT analysis can help enterprises gather resources and actions in their strengths and places with the most opportunities and let the enterprise’s strategy become clear. On this basis, the PEST method is helpful to understand the influence of multiple factors in detail. PEST law is from four aspects: politics, economy, society, and technology. The formulation of the company’s strategy is inseparable from influence of multiple factors indetail. PEST law is from four aspects: politics, economy, society, and technology. The PEST analysis can better grasp the current situation of the macro environment and the trend of changes from all aspects, which is conducive to the early detection of threats to the economic environment as shown in Figure 2.

SWOT-PEST analysis method generally analyzes from two aspects: internal factors (strengths and weaknesses) and external environment (opportunities and threats). Each single item can be specifically analyzed from the perspectives of politics, economy, society, and technology according to different analysis objects, and then the above contents are listed in the matrix. There are four intersections, which are the four strategies to be obtained as shown in Figure 3.

The selection and evaluation principles of relevant factors in SWOT-PEST theory are as follows. Optimization objective: we need to find an optimal parameter \( \theta \), assuming that the number of parameters is \( \theta_1, \theta_2, \ldots, \theta_n \).

\[
\theta^* = \arg\min \ L(\theta),
\]

where \( L \) is a function, and the gradient vector of \( l \) can be expressed as follows:

\[
\begin{bmatrix}
\frac{\partial L(\theta_1)}{\partial \theta_1} \\
\frac{\partial L(\theta_2)}{\partial \theta_2}
\end{bmatrix}
\]

(1) Randomly select an initial parameter vector \( \theta^0 \):

\[
\theta^0 = \begin{bmatrix}
\theta_1^0 \\
\theta_2^0
\end{bmatrix}.
\]

(2) Calculate the gradient of the optimization function in the initial parameters \( L \):

\[
\nabla L(\theta^0),
\]

where \( \nabla \) represents the gradient.

(3) Update parameters:

\[
\theta^1 = \theta^0 - \eta \nabla L(\theta^0).
\]

Namely:

\[
\begin{bmatrix}
\theta_1^1 \\
\theta_2^1
\end{bmatrix} = \begin{bmatrix}
\theta_1^0 \\
\theta_2^0
\end{bmatrix} - \eta \begin{bmatrix}
\frac{\partial L(\theta_1^0)}{\partial \theta_1} \\
\frac{\partial L(\theta_2^0)}{\partial \theta_2}
\end{bmatrix}.
\]

Our optimization function \( L(\theta) \) is as follows:

\[
L(w, b) = \sum_{n=1}^{10} (y^n - (b + w \cdot x_{cp}^n))^2,
\]

where \( w \) and \( b \) are the two parameters of function \( L(\theta) \).

Then our optimization goal is

\[
w^*, b^* = \arg \min L(w, b) = \sum_{n=1}^{10} (y^n - (b + w \cdot x_{cp}^n))^2.
\]

Because we have to traverse the whole data set every time, we perform gradient descent, which is obviously inefficient. Our idea is whether we can randomly select the gradient information of a sample to replace the gradient information of the whole data set every time we perform gradient descent.

\[
L''(y^n - (b + \sum w_i x_{cp}^n))^2.
\]

Therefore, our idea is that the gradient update should be related to the previous gradient (this is proved in detail below). We choose to add the square sum of the previous gradient \( w^t \) to affect the step size of the current gradient update, that is,

\[
w^{t+1} = w^t - \eta \frac{\sigma}{\theta} g^t,
\]

\[
\eta^t = \frac{\eta}{\sqrt{t + 1}},
\]

\[
g^t = \frac{\partial L(\theta^t)}{\partial \theta^t},
\]

\[
\sigma^t = \sqrt{\frac{1}{t + 1} \sum_{i=0}^{t} (\theta^i)^2},
\]

where \( \eta \) and \( \sigma \) represent parameters related to efficiency. Therefore, the simplified formula is obtained as follows:

\[
w^{t+1} = -\frac{\eta}{\sqrt{\sum_{i=0}^{t} (\theta^i)^2}} g^t.
\]

2. Advantages

2.1. Political Advantages. At present, world sports competitions are booming, and China’s slightly important sporting events will usher in a new round of golden development period. The outline for building a strong sports country issued by the State Council requires that by 2020, a new
A sports development mechanism suitable for society in a way should be established, the physical literacy and health level of the whole nation should be continuously improved. The sports industry has made new progress in achieving high-quality development. By 2035, a new pattern of sports development with strong government leadership, orderly social norms, vibrant market, active participation of the people, healthy development of social organizations, improvement of public services, and adaptation to the basic realization of modernization will be formed, and the sports governance system and governance capacity will be modernized. The youth sports service system has been improved; the physical quality has been significantly improved; the health status has been significantly improved; and competitive sports are better, faster, higher, and stronger. Summer and winter events, men and women’s events,

| Match                  | Time   | Place   | Delegation | Number of athletes | Major items | Event level  |
|------------------------|--------|---------|------------|-------------------|-------------|--------------|
| Olympic games          | 2008   | Beijing | 204        | 11,438            | 28          | International|
| Winter games           | 2009   | Harbin  | 44         | 2,366             | 12          | International|
| National games         | 2009   | Shandong| 47         | 10,991            | 33          | Domestic     |
| Asian games            | 2010   | Guangzhou| 45       | 9,704             | 42          | Intercontinental|
| Universiade            | 2010   | Shenzhen| 152        | 7,865             | 24          | International|
| East Asian games       | 2011   | Tianjin | 9          | 2,422             | 24          | Intercontinental|
| National games         | 2013   | Liaoning| 37         | 9,500             | 31          | Domestic     |
| Youth Olympic games    | 2014   | Nanjing | 204        | 3,787             | 28          | Domestic     |
professional and professional sports, “three balls,” and basic events have achieved balanced development, and their comprehensive strength and international influence have increased significantly. The sports industry is bigger, more active, and better and has become a pillar industry of the national economy. The appeal, influence, and cohesion of sports culture have been continuously improved, and the Chinese sports spirit has been inherited and carried forward.

Sports and exchanges with Hong Kong, Macao, and Taiwan are more active, comprehensive, and coordinated, which has become an important aspect of the diplomacy of major countries with Chinese characteristics and the cause of “one country, two systems” [8–12].

2.2. Economic Advantages. From 2013 to 2017, the GDP and its growth rate and the proportion of the added value of the three industries in the GDP are shown in Figures 4 and 5.

In the process of urban development, the proportion of the tertiary industry will show a gradual upward trend, and the urban development resources will gradually gather to the tertiary industry. The holding of slightly important sporting events can accelerate this process and promote the optimization of urban industrial structures.

2.3. Social Advantages. According to the statistical bulletin of the People’s Republic of China on national economic and social development in 2017 issued by the National Bureau of Statistics, the per capita disposable income of residents in 2017 was 25,974 Yuan. From 2013 to 2017, the per capita disposable income of national residents and its growth rate are shown in Figures 6 and 7.

As can be seen from Figures 5 and 6, because of the rapid development from 2013 to 2017, it is not only conducive to improving the living standards of residents but also laid a social foundation for the holding of slightly important sporting events.

2.4. Technical Advantages. Nowadays, with the effective application of various advanced technologies and concepts, the host cities of large-scale events have reduced the number and scope of traffic control and do not take it as the main means of traffic management. The implementation of reasonable traffic control not only can promote the smooth progress of the event but also can bring convenience for travel and tourism and then promote the economic development of the host place.

3. Disadvantages

3.1. Political Disadvantage. The risks of slightly important sporting events are divided into 10 categories. The risks of economic benefits account for 3 of them, mainly including income loss risk, property loss risk, and revenue and expenditure matching management risk. Since the Beijing Olympic Games, China has held nearly 10 large-scale comprehensive sporting events. Although some experience has been formed in the operation and marketing of slightly important sporting events, the loss situation of events has not been reversed, and the frequency of events has not slowed down. On the contrary, it has stepped into the strange circle of losing every competition. Although all aspects must be strictly evaluated and monitored when bidding for each sports event, the risk assessment is always
too optimistic and even deliberately avoided the potential competition risk. Before bidding for various competitions, western countries should evaluate through a scientific evaluation system to avoid the economic risks and losses of hosting competitions as far as possible. Therefore, the reason for the loss of holding slightly important sporting events in China is the lack of a scientific risk assessment system and lack of risk prevention awareness of the events themselves.

3.2. Economic Disadvantage. It is the original intention of leaders and decision-makers to bid for the event to bring comprehensive benefits through the operation of slightly important sporting events. Many countries in the world have achieved great economic, social, and sports benefits through slightly important sporting events. For example, the 1984 Los Angeles Olympic Games made a net profit of US $225 million through successful operation, which is also the first successful case of turning losses into profits in the history of the Olympic Games. However, China’s current bid for most sports events eventually backfired. This is closely related to the blind exaggeration of the benefits of the event by some experts, scholars, and decision-makers. For example, a leader of Guangzhou Sports Bureau once said optimistically, “the 2010 Asian Games will play a very obvious role in driving the development of Guangzhou’s sports industry. Within a relative time and space boundary, experts estimate that the Asian Games will bring more than 800 billion yuan to Guangzhou.” However, the final loss of the Guangzhou Asian Games was more than 210 billion yuan, which was far from the economic benefits originally envisaged.

3.3. Social Disadvantage. The most widely questioned by the public comes from the overall public cost of slightly important sporting events. According to statistics, the financial
The budget of Pingchang Winter Olympic Games is US $7 billion, but the total cost after the event is as high as US $13 billion, exceeding the total budget by US $6 billion. If the Winter Olympics in Pingchang are slightly overspent, then the 2014 Sochi Winter Olympics in Russia will be a “model” for serious overspending. The initial budget of the Winter Olympic Games was US $12.3 billion, but it actually cost US $52 billion at the end, and the total expenditure was surprisingly 4.5 times as high as the budget. In the Beijing Winter Olympics, there is also a report that cannot be ignored. The financial budget for bidding for the Winter Olympic Games in the report has two parts: first, the budget for the event is about US $1.56 billion. In other words, even after the “slimming plan” and inheriting the “huge legacy” of the 2008 Olympic Games, the budget of the Winter Olympic Games is as high as more than US $3 billion. At most, seven cities in the world were interested in bidding for the 2022 Winter Olympics, leaving only Beijing and Almaty. Other cities such as Stockholm and Munich withdrew from the competition because of their high budget. This has prompted the IOC to issue the 2020 resolution and embark on the road of reform. In the past few decades, driven by the enthusiasm of emerging countries to set up large-scale international sports events, various sports events have been enthusiastically pursued. However, now both international sports organizations and emerging countries are aware of the urgency of reform and reflection. In short, the reform of the IOC and the public’s doubts are extremely consistent in terms of economic austerity. In the past, Keynesianism, which relied on expansionary economic policies to promote economic growth by increasing demand, has been increasingly criticized as excessively expensive and impractical in the field of sports events. The distribution of sports events at all levels this year is shown in Figure 8.

In different years, each sports event will change slightly, but it still makes an economic contribution based on small events. Taking the 13th Winter Games as an example, it has a positive impact on the economic development of Xinjiang. These positive effects are mainly reflected in accelerating the construction of various stadiums and Gymnasiums in
Xinjiang, accelerating the construction of rail transit in Xinjiang, improving the level of communication equipment in Xinjiang, promoting the development of tourism and catering hotel service industry in Xinjiang, increasing the sales of ski equipment and outdoor supplies, providing employment opportunities, and so on. By comparing the types of sports events in Figure 8, it is obvious to calculate that smaller events play an important role in the regional economy each year. Its share is always around 40%, which is extremely important in the regional economy.

3.4. Technical Disadvantages. Tianjin successfully hosted the 13th National Games in 2017. There are 49 competition venues in national games, including 21 new venues, 15 reconstructed venues, 11 existing venues, and 2 venues located in different places. The total construction area of the new building reached 260,000 square meters, with an increase of 70,000 audience seats. After the competition, how to make effective use of these venues and facilities serving the National Games has become a problem that Tianjin municipal government needs to solve. How to ensure the operation and rational use of these venues has become an important research content of the Tianjin municipal government. Now that the Tianjin National Games has just ended, the problems existing in the utilization of venue facilities have not been clearly highlighted. We can study the utilization of venue facilities of similar slightly important sporting events at home and abroad, so as to provide a reference for the utilization of venue facilities of Tianjin National Games. The venues of a series of slightly important sporting events held abroad are also idle or even abandoned after the games, which is also one of the problems for governments all over the world.

4. Opportunities

4.1. Political and Economic Opportunities. Globalization makes the competition between urban areas take on new significance. The competitiveness of urban areas has become an important link in the competition of comprehensive national strength. How to improve the competitiveness of their urban areas has become the most concerned and troublesome thing for decision-makers. Sports play a unique role in enhancing the competitiveness of an urban area. Now many European and American cities try their best to attract international famous sports events and professional sports clubs to settle in their cities and give them many preferential policies such as finance, taxation, and land use, trying to maximize the development of their sports industry.

4.2. Technical and Social Opportunities. Through extensive publicity, major events improve media exposure. By studying the publicity reports of the media and other channels on the venue of major events, we can see that its positive reports can greatly improve the image of the venue and increase people’s cognition. Some cities will set up their own distinctive and strong image banner and enhance the theme image of the city through the holding of major events [13–20].

Whether in the past historical process or investigating the most intuitive feelings of urban residents, we can draw a common conclusion that slightly important sporting events have made a great contribution to improving urban infrastructure. The scale and influence of slightly important sporting events will put forward requirements for the local land use mode, urban transportation network, infrastructure, and so on. The time of the event is determined in advance, which also forms a time constraint on the completion of the design and construction of these transportation operation systems and transportation systems. The integration and completion of urban infrastructure are the inevitable results of holding events. Traffic demand management has to be implemented to alleviate traffic congestion during major events, which not only helps event planners ensure the success of major events but also provides them with a lot of information to guide their investment decisions.

5. Threats

5.1. Political Challenges. The holding of each large-scale sports event tests the management and service level of the government. The construction and transformation of stadiums and supporting infrastructure should be based on long-term layout planning, make full use of existing venues and facilities, effectively avoid repeated construction, and always follow the policy of “streamlining calculation and saving cost” to streamline institutions and personnel. In terms of China’s current economic structure and economic level, the marginal consumption tendency of the whole

Figure 8: Sports events at different levels in different years.
country is still very low, which will restrict the full utilization of event resources to a great extent. In addition, China still lacks a number of enterprises and intermediaries specializing in event management; the operation mode of sports events lacks innovation; and there is no perfect risk management mechanism and system level. China has become one of the most active countries in the world in hosting slightly important sporting events. By hosting sports events of all sizes and through continuous practice and exploration, we will gain more and more experience in the commercial operation of events. Finally, China will become a sports power and a major event hosting country.

5.2. Economic Challenges. Holding slightly important sporting events requires professional competition venues. With the preparation of events, the host place increases investment through various channels to carry out large-scale construction and transformation of various sports venues and facilities and supporting infrastructure in the region. Such construction and transformation are often large-scale and high investment. On the one hand, it has driven the rise of the sports service industry and provided a large number of employment opportunities. During the preparation period of the 1992 Barcelona Olympic Games, nearly 300,000 new jobs were created, and 100,000 jobs were created during Sydney Olympic Games. On the other hand, holding slightly important sporting events can also drive the development of related industries, especially the tourism industry, which has become an important economic source of the host place. However, with the end of the event, due to the impact of the sharp decline in demand in the later stage and the prominent utilization and maintenance problems of stadiums and gymnasiums, it has an impact on the subsequent development of the regional economy of the host region, and the overall economy of the host region will fall into a recession to a certain extent.

5.3. Social Challenges. There is no doubt that holding slightly important sporting events can play a great role in promoting the image and popularity of the host city. Through media reports and publicity, the venue buildings and local customs of the host city will be spread all over the world. For example, during the 2009 Shanghai F1 China Grand Prix, the number of overseas TV viewers reached 600 million. In addition, because of its wide popularity and international influence, slightly important sporting events can form a potential sports culture and affect the ideas of the host city residents, which are reflected through behavior, thus affecting the city’s culture. The host city can effectively publicize and display its self-image. However, with the preparation and holding of events, the construction of a large number of sports infrastructure venues, and the increase of land demand, it is bound to lead to the rise of land prices and the expansion of the income of the real estate industry. For example, after F1 settled in Jiading, Shanghai, the auction price of the same piece of land increased by 10 times. At the same time, during the event, a large number of participants and tourists pour into the host city. The sharp increase in demand is likely to lead to the rise of short-term prices and traffic load in the host city.

5.4. Technical Challenges. There will be high media exposure during major events, and a large number of media will put forward requirements for all aspects of the urban environment in the short term. Such high-intensity publicity has generally improved and increased people’s awareness of environmental protection. Major events can be used as a catalyst to attract attention to the environment, natural landscape, and local heritage that may be ignored, so as to improve the protection and care of the natural environment and local sites. The influx of many people during the holding of major events will produce a lot of domestic garbage and environmental pollution, which may pose threat to the natural environment of the host city, and the planning of urban infrastructure and public places will also directly or indirectly damage the natural ecological environment and interfere with the cultural environment. What’s more, it will affect the daily life of the local residents. At the same time, due to the characteristics of the short-term high outbreak and value-added activities, a large number of domestic and foreign athletes, journalists, spectators, and other personnel poured in, which brought great pressure to the whole living environment, traffic conditions, and social security of the city. More scholars pointed out that the impact on the local cultural landscape and natural landscape caused by holding major events has a long-term impact on the environment, climate, and other aspects of the host place, which cannot be changed and restored in a short time. In the later stage of the event, the huge pressure generated by the urban environment will lead to corresponding ecological problems and produce a large amount of garbage, waste, and noise pollution, causing damage to the ecological environment and reducing urban comfort [21–26].

The results of coupling analysis and evaluation of relevant SWOT-PEST elements are shown in Figures 9–11.

As can be seen from the above Figures 9–11, receiving government regulation under different external factors refers to the supervision and control activities carried out by the government to prevent private enterprises from not fully considering public interests such as fairness, health, and safety when making decisions. As a public welfare industry, at this stage, some special areas of the sports industry are still directly managed by our government. It can act directly on enterprises with the help of relevant laws and regulations. The regulation constrains and restrains the enterprises and the industry. In the role of disadvantages and opportunities, threats and other related factors opportunities obviously occupy a larger proportion of space. It is an important factor under the whole SWOT model.

At the same time, today’s world science and technology is developing rapidly, and internal technology is developing rapidly around the world. Science and technology is the booster for the development of the sports industry. The technological environment of sports industry management includes the following important factors: the general level and changing trend of current sports industry science and
technology, new sports products, and services emerge with the emergence of new sports technology; breakthroughs in new sports technology have a great impact on the activities of enterprises involved in sports industry operation and management.

Changes in population structure and numbers, the impact of current socio-political relations, and changes in social values have had a profound and significant impact on the structure of the industry and the size of the economy. The demand for physical exercise among people of all ages has changed significantly compared to the past. Young people's pursuit of fashion and the excitement of extreme sports are right in line with their psychology. Therefore, sports equipment and training equipment and technology are becoming a new sports industry and a very important factor influencing the regional economic benefits of sports events. Finally, with the advance of time and the overall change of the region, the change trend of each factor will show the law shown in Figure 12 through the calculation of the SWOT-PEST model.

With the continuous development of China's social economy and the frequent holding of slightly important sporting events, the social value brought by sports events is more obvious. Compared with other times, the attention to slightly important sporting events is obviously higher. Therefore, closely linking the value function of sports events

Figure 9: Multifactor influence distribution under advantages and disadvantages, disadvantages and opportunities.

Figure 10: Multifactor influence distribution under advantages and opportunities, advantages and threats.
with people’s needs can make the audience meet both psychologically and physiologically. The first is sensory pleasure, which is mainly reflected in the entertainment performances interspersed in the event, such as the popular “football baby,” “racing girl,” and so on. These are important parts of sports events. With the development of society, people’s requirements are also gradually improving. Compared with the events regulated by the government or associations, the events formed in the form of companies are more valuable. The local economy also has high requirements for the benefit of the competition. The scientific and technological means is to ensure that the audience’s demand for watching the competition is mainly reflected in the safety needs. Safety needs are the subconscious needs of the audience when they arrive at the stadium. On the one hand, when watching the event, we should pay attention to the overall environment, grasp the overall rhythm of the venue, and pay high attention to the security order and safety of the venue. At the same time, this is also the main reason why a game can be carried out smoothly. On the other hand, it shows whether the dialogue between the audience and the competitive behavior on the field is safe. Only by ensuring the safety of the contestants and the safety of the audience can the audience have certain approval and attention to the event. In the process of watching events, slightly important sporting events are not only the contact and communication between players and countries but also one of the main platforms for audiences to contact feelings, enhance friendship, and strengthen communication. Because the needs of the masses for sports events are dynamic, it can
reflect not only the vertical needs but also the horizontal satisfaction, so as to meet the spiritual needs of the public for sports events.

6. Conclusion

Using the SWOT-PEST model, this paper provides an in-depth analysis of the impact of different levels of important sporting events on the regional economy. This paper introduces the SWOT-PEST model and provides an in-depth analysis of the impact of marginally important sporting events on the regional economy in terms of both internal and external factors. The strengths, weaknesses, opportunities, and challenges of marginally important sporting events on the regional economy are clearly demonstrated, and targeted and feasible countermeasures and suggestions are proposed. It is clearly seen that the number and chance of small events held in the ordinary state are higher than international events and so on. It has an important role in the regional economy. International events not only can bring high economic benefits but also can have high risks. This paper discusses the opportunity advantage (so) of using one’s own advantage to grasp the opportunity and the disadvantage and advantage (wo) of overcoming one’s disadvantage to seize the opportunity; this paper proposes countermeasures and suggestions related to promoting the regional economic development of slightly important sports events from two aspects: the advantage of using one’s own advantage to overcome the threat (st) and the disadvantage of overcoming one’s own disadvantage in the threat (WT).

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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