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The Economic Multiplier Effect of Mega-Sporting Events: A Case Study of the Formula 1 Shanghai Grand Prix on Urban Tourism and Consumer Spend

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Abstract:

This study explored the economic multiplier effect of the Formula 1 (F1) Shanghai Grand Prix on the local tourism industry, filling the research gap in the literature on the economic multiplier effect of large-scale events. By combining Keynesian multiplier theory with empirical data (including official reports and responses to 209 questionnaires), the analysis results show that the 2024 event brought a direct economic impact of 1.406 billion yuan and an indirect output of 3.928 billion yuan, creating 9,857 jobs. The theoretical multiplier (3.12) is higher than the observed multiplier (2.793), because of the economic leakages such as international expenses (eg FIA licensing fees), imports, and cross-border expenditures which together account for 34.6% of the total economic impact. Although 78% of the participants were non-local tourists, which promoted the short-term tourism in Shanghai and the Yangtze River Delta region, significant challenges also emerged, including traffic congestion (reported by 69% of residents) and noise pollution. The survey results indicated that tourists were highly satisfied (88.7% willing to visit again), but also identified concerns about infrastructure and prices. In conclusion, the recommendations for sustained development include (1) minimizing leakages by strengthening local supply chains (2) increasing the marginal propensity to consume through targeted consumption vouchers; (3) promoting regular route usage (eg. car tourism); (4) introducing community compensation mechanisms.

This study emphasises that safeguarding residents' well-being alongside pursuing economic gains is essential for ensuring long-term viability. Limitations include the restricted sample size and limited accessibility of relevant data.

Keywords: Formula One Shanghai Grand Prix, Multiplier effects, Urban tourism, Consumer spending

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1. Introduction

In recent years, mega-sporting events have become increasingly significant for urban economic development globally. Cities worldwide compete for hosting sports events like the Olympics, FIFA World Cup, and Formula 1 Grand Prix, aiming to increase their global exposure. The first Formula One Grand Prix was held in 1950 at the British Silverstone racing track. In 2025, the FIA Formula 1 calendar will feature 25 races.

In 2004, the first F1 Shanghai Grand Prix was held in Shanghai, China. Since then, the annual event has continued to grow in popularity, attracting both foreign and local spectators and generating significant income for the local economy. Following the event's return to Shanghai in 2024 (after being cancelled between 2020 and 2023 due to the COVID-19 pandemic), it attracted more than 200,000 domestic and international visitors (Shanghai government, 2024).

With the substantial public and private investment required to host and maintain a F1 Grand Prix, it is important to investigate the overall economic feasibility of hosting such an event. While mega-events can boost tourism, including hospitality, retail, and transportation sectors, there are also risks of negative impacts on the residents, inadequate infrastructure, and displacement of regular tourism. In 2024, the F1 Chinese Grand Prix made a significant contribution to Shanghai's sports economy, with direct economic impacts (immediate, first-round effect of an initial expenditure or activity on an economy) amounting to 1.406 billion yuan. In terms of indirect economic effects, it generated an economic effect of 3.928 billion yuan, tax revenue effects of 137 million yuan, and created 9,857 employment opportunities (Shanghai Event assessment report, 2024).

The economic impact of other mega-events, such as the Winter Olympics and the CBA (Chinese Basketball Association), has been widely researched, but few studies directly focus on F1 racing. Furthermore, analyses within the limited studies focusing on F1 rely on theories and are focused on the importance of policy supports, but lack the analysis of the event's specific contribution to urban tourism, including visitor spending, job creation, and longer-term benefits.

In this dissertation, the multiplier effect and related data will be used to investigate the economic impacts of the F1 Shanghai Grand Prix, with the focus on its impact on urban tourism. Additionally, questionnaires will be distributed to explore the attitudes and opinions of both F1 event visitors and Shanghai residents to identify areas for improvement and steps required to promote the sustainable development of this and other similar events in the future. The analysis will consider both the short-term impacts during the event period and potential longer-term tourism effects, making recommendations for the future sustainable development of the Sports event economy.

2.Literature review

2.1 The Multiplier Effect

The Multiplier Theory was initially proposed by British economist R.F. Kahn in 1931 and later refined by John Keynes in his work The General Theory of Employment, Interest and Money (1936) as the "Investment Multiplier Theory." The core mechanism suggests that initial changes in expenditure (such as investment or government spending) trigger successive rounds of consumption through the marginal propensity to consume (MPC, a value between 0 and 1), ultimately leading to a multiplied increase in national income. The multiplier is expressed as:

Multiplier (K) = 1 / (1 – MPC)

According to the theory, a higher MPC results in a more pronounced multiplier effect. For example, if MPC = 0.8, then k = 5, meaning an initial investment of 1 million yuan can generate total societal income of 5 million yuan.

Empirical studies across various economic contexts consistently support the reliability of multiplier models. For instance, research published in the Journal of Wuhan Institute of Physical Education analyzed input-output data from 2002 to 2017 and demonstrated a growing multiplier effect in the sports industry. The study found that each unit of sports investment drove a GDP increase of 2.37 yuan in 2002, rising to 3.08 yuan by 2017—a 30% growth. This optimization was largely attributed to the increasing share of the service sector, which raised the MPC. Notably, the sports construction industry accounted for 68% of the multiplier-driven growth due to its direct impact on upstream industries such as raw materials and equipment (Liu, 2021).

2.2 The Economic Effect of Sports Events in China

2.2.1 Sport Industry Data Review

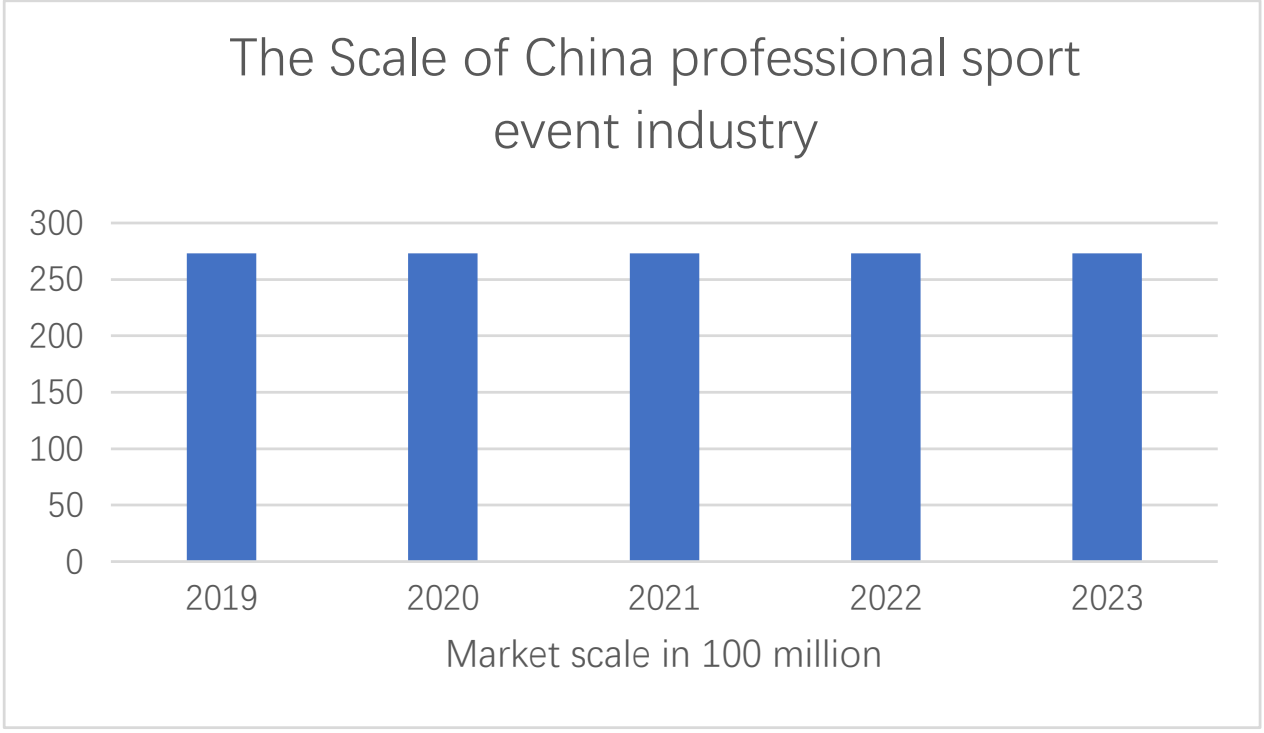
China's sports industry has demonstrated significant economic influence.As China Sports (2024) reported the total scale of the industry reached 3.67 trillion yuan, a year-on-year increase of 11.31%, with an added value of 1.49 trillion yuan (China Sports Daily). Under the "14th Five-Year Plan for Sports Development," the total industry scale is projected to exceed 5 trillion yuan by 2025, with the added value accounting for 2% of GDP. Sports consumption is expected to reach 2.8 trillion yuan. Specialized sectors such as ice sports and outdoor activities have seen growth rates exceeding 20%. In 2024, sports consumption vouchers worth 640 million yuan were issued nationwide, stimulating related spending of 1.95 billion yuan—a multiplier effect of 1:3.05. Sales of sports and recreational goods grew by 14.2%, significantly outpacing the 4.7% growth

in total retail sales.

The sports event industry in China has maintained overall growth despite a contraction in 2020 due to the COVID-19 pandemic. According to National Bureau of Statistics 2023), the market size the market size recovered to 42.7 billion yuan. Professional sports events constitute the main segment, with the market scale reaching 27.3 billion yuan in 2023.

The Formula One Shanghai Grand Prix exemplifies this economic impact.TTG (2025) recorded, the 2025 event attracted 220,000 attendees, a record high, with 15.25% foreign spectators (60% of whom travelled specifically to Shanghai) and 70% domestic non-Shanghai residents (Liu, 2025). The 2024 edition generated direct revenue of 1.406 billion yuan, boosted the local economy by 3.928 billion yuan, and contributed tax revenue of 137 million yuan (Yang, 2025). Hotel occupancy in Jiading District exceeded 95% during the event, and customer flow in key commercial areas doubled. Related industries (hotels, dining, transportation) contributed 1.593 billion yuan to the regional economy. The total economic impact of sports events in Shanghai in 2024 was 30.99 billion yuan, with F1 accounting for over 10% (2024 Shanghai Event Influence Evaluation Report). China's F1 fan base exceeds 200 million, representing nearly 25% of the global total of 826.5 million, with a demographic skew toward younger, highly-educated, and high-income individuals, half of whom are female (TechWeb,2024).

Policy support has further amplified these effects. In 2025, the Shanghai government issued 60 million yuan in sports consumption vouchers (including F1-related vouchers), stimulating spending by a factor of 3.1. TTG (2025) recorded, within six months, 29.81 million yuan worth of vouchers were redeemed, generating 91.04 million yuan in consumption in Shanghai. Additional initiatives included discounts on cultural and tourism activities for ticket holders, and the coordination of concurrent events such as the Shanghai Peach Blossom Festival and the Shanghai Automobile Culture Festival, extending the event's spatial and temporal impact (News China,2024).



Secondary data 1: The Scale of China professional sport event industry
Source: National Bureau of Statistics

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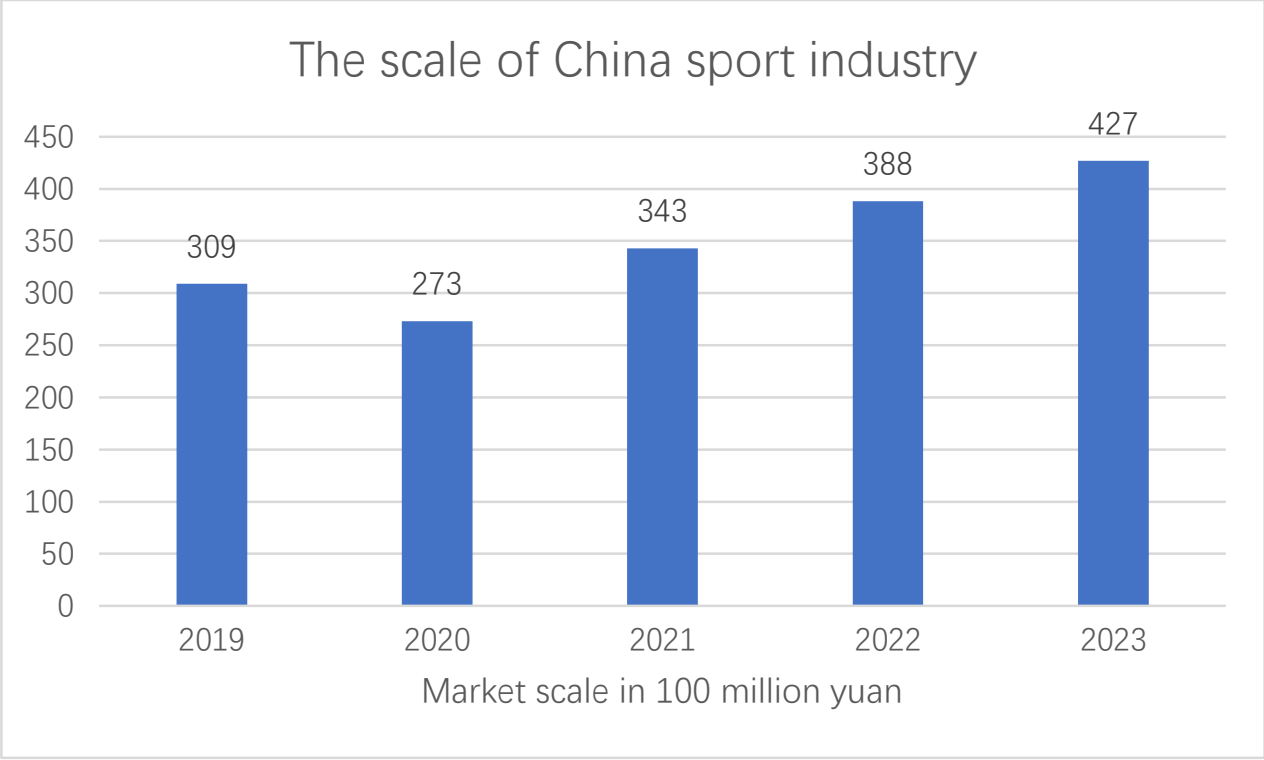

Secondary data 2: The scale of China sport industry
Source: National Bureau of Statistics

2.2.2 Academic Analysis of Sports Events on Economy

Academic research on the economic impact of sports events has largely focused on mega-events such as the Olympics and the World Cup.

The F1 Shanghai Grand Prix, though a mega-event, incorporates a "dual-scenario" model (track events + city-center carnival) that represents a small-scale extension. This hybrid nature necessitates reevaluation within theoretical frameworks typically applied to community-level events.

Huang Haiyan (2019) developed an evaluation system for sports events that incorporated intangible indicators such as "citizens' pride" and "city image." However, the challenge of quantifying these indicators—such as the long-term value of enhanced international reputation from hosting F1—remains unresolved. Current methods rely heavily on surveys, limiting their integration into economic multiplier models.

Furthermore, existing multiplier models often confine analysis to host city boundaries, neglecting regional spillover effects. For example, the F1 Shanghai race attracts 78% of visitors from outside the city and promotes 15 cultural-tourism routes across the Yangtze River Delta region (Cheng, 2025). Despite this, cross-regional economic benefits—such as those attempted by Suzhou through industrial collaboration—face challenges in revenue distribution and supply chain integration, limiting the multiplier effect to the host city rather than extending it to the broader urban agglomeration (Liu Siping, 2025).

In " Keynes at the periphery: Currency hierarchy and challenges for economic policy in emerging economies "(2017), three professors demonstrated that the Keynesian multiplier theory assumes a closed economic system, but in the context of globalisation, cross-border flows of capital and income are significant.

This review highlights the need for more nuanced theoretical approaches that account for the scale, frequency, and regional connectivity of sports events, to better capture their full economic impact.

2.3 Research Gap

In their review of 120 studies on the sports economy, Zourgani & Ait-Bihi's found that 70% of existing literature focuses on economic evaluations of large-scale events like the Olympics and the World Cup, while there is a lack of research on the multiplier effects of smaller-scale events. This gap has led to theoretical models that rely heavily on a "high investment-high return" logic, which fails to account for the sustainable multiplier effects that smaller-scale events can achieve through frequent hosting (Liu, Trade Fair Economy). Although the F1 Shanghai race is a mega sports event, its "dual-scenario" model (track + city center carnival) represents a small-scale ex-

tension of a large event. Therefore, it needs re-evaluation at the community level within the theoretical framework of smaller-scale events.

3. Methodology

3.1 Overview

To examine the economic impact of the F1 Shanghai Grand Prix and provide suggestions for future development, relevant scholarly literature and empirical data were needed. Thus, the secondary research on the economic impact, such as gross domestic product and employment rate, was conducted to establish a conceptual framework for this study. Additionally, questionnaires were delivered as primary research to two target groups: the general public including Formula 1 fans, and Shanghai residents in order to gather their opinions on the race and detailed consumption data. This data collection was essential for demonstrating the economic impact of the F1 Shanghai Grand Prix and for predicting future trends.

3.2 Literature research

In the literature review, studies on the economic impact of domestic sports events—such as the CBA (Chinese Basketball Association) and the National Games—were examined to analyse their research structures and methods, and to assess their relevance to this study.

A reading log was created to record and evaluate literature. Several factors were considered using the CRAAP principle, including publishing date, relevance of the literature to my project, and reliability. The log also included information on article titles, authors, publication dates, and sources to ensure the validity.

As my research applied the multiplier effect to investigate the economic effect brought by F1, it is better to directly refer related literature. So early literature was used, the oldest one is "The General Theory of Employment, Interest and Money" (1936), which is the proposal of the multiplier effect. As those old literature is relate to theory comes from reliable sources, which did not changed a lot over decades, they can still be used.

Literature was sourced from various platforms, including CNKI (China National Knowledge Infrastructure), Science Direct, and Google Scholar. CNKI, in particular, is recognised as China's most authoritative and comprehensive academic database.

3.3 Data research

3.3.1 Primary Research

To collect both quantitative and qualitative primary data, two separate questionnaires were designed for different target groups.

3.3.1 .1Questionnaire 1 – Shanghai Residents

This survey focused on assessing the local impact of the event and gathering suggestions for long-term development, including contributions to the community. It included questions on basic demographic information and respondents' opinions on the race. A total of 88 valid responses were collected by 30 July 2025, of which 44 were from Jiading District, where the Shanghai International Circuit is located.

3.3.1 .2Questionnaire 2 – General Public and F1 Fans

This survey targeted the general public and Formula One fans, aiming to investigate their willingness to travel to Shanghai for the event, their opinions on the race, specific spending patterns, and other related behaviours. A total of 121 valid responses were collected by 27 July 2025.

3.3.2 Secondary research

Data about the economic impact of the F1 racing Shanghai Grand Prix was collected, including number of jobs created, unemployment rates, event revenues and costs, number of domestic viewers, number of foreign viewers, and the gross domestic product throughout the race period,

The CNBS (China National Bureau of Statistics), the Shanghai government official website, the national interbank funding center, and the FIA official website were used. The FIA official website is run by the Federation Internationale l'Automobile, which is responsible for organizing most of the motor racing sports events. The other three are national platforms offering detailed economic-related data. CNBS was primarily utilized for seeking Shanghai regional data and relevant research, and the national interbank funding center official website is used to find the financial website for Jiushi Group. When CNBS data were unavailable, data from the other platforms were considered as alternative sources.

3.3.3 Data Analysis Methods

Questionnaire data were represented using pie graphs, line graphs, and histograms are created to visualise respondents opinions on this event. A comparison was also made between respondents' willingness to spend and their actual expenditure on attending the race.

Secondary data covered the period from 2004 to 2025, as the Formula One Shanghai Grand Prix was first held in 2004, but was canceled in 2020 - 2023 due to COVID-19. These data were used to create graphs, calculate the multiplier effect, and analyse future trends. Excel sheet functions were applied to the raw data to perform calculations such as determining the leakage ratio.

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3.4 Limitations & Difficulties

This research faced several limitations. The questionnaire sample size was limited to about 208 responses, with some regions and income groups not represented, reducing the accuracy and generalisability of the findings.

Accessing highly relevant literature was also challenging, as few studies focus specifically on Formula 1. In addition, financial reports are typically released at year-end, so data for the 2025 event were unavailable at the time of writing.

Certain data, such as the specific costs of organising the event, were also not accessible , making it difficult to assess the direct impact on the businesses.

4. Result

This study aims to explore the impact of the F1 event on tourism and consumption in Shanghai, as well as the multiplier effect it brings to the economy. Furthermore, it will discuss the influence of the event on regional economic development and how to better avoid the negative experiences for spectators and local residents during the event, to maximise the economic benefits.

The following section first presents data on tourism and consumption generated by the event, followed by feedbacks by viewers and residents (4.2),examine the event's current impact based on questionnaire feedback and explores ways to address negative effects. Section 4.3 calculated the multiplier of F1 Shanghai Grand Prix. In the questionnaire analysis, scores above 3 (on a 5-point scale) are considered high.

4.1 Economic impact brought by F1 Grand Prix

4.1.1 Economic benefits brought by race viewers

Holding this event not only attracts Formula One fans who travel to Shanghai to watch races, but also boosts spending in the local communities and regions nearby.

Among respondents who visited the event, 48.15% of them came to Shanghai for the first time, indicating the F1 Shanghai Grand Prix was effective in attracting visitors. In addition, 70.38% of them visited the central area of Shanghai or the surrounding cities, boosting Urban tourism in the short term.

48.51% of the participants spent ￥2001 to ￥5000 to attend this race, with the highest cost for 40.71% of the participants being tickets, and the second highest at 25.93% was for accommodation. The average cost of a Formula One ticket is €153 (FIA official), equal to about ￥1268.2 . This means, in addition to buying the tickets, visitors were also spending locally, bringing economic benefits to the local community.

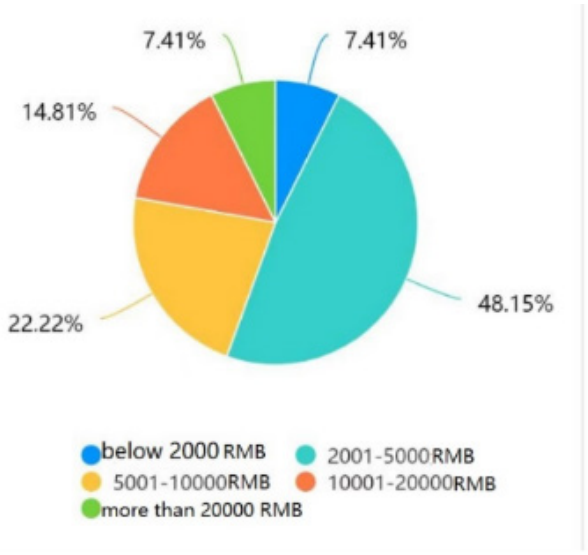

Figure 1: Total Cost for watching the Race

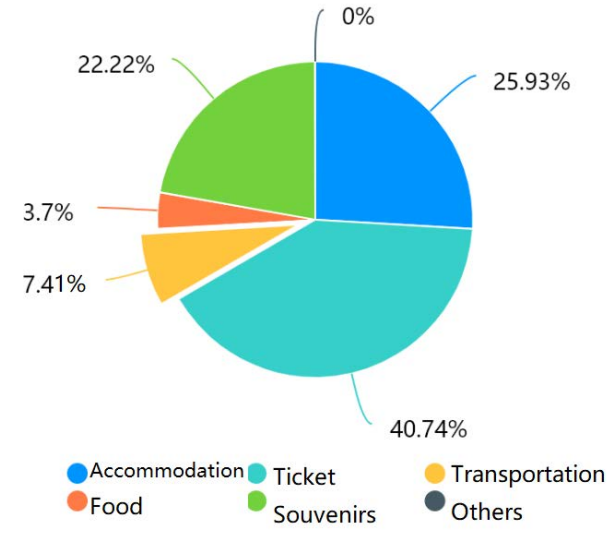

Figure 2: Category with the highest cost

4.1.2 Residents' perception of the economic effects

The F1 Shanghai Grand Prix attracts over 200,000 spectators, creating noticeable short-term economic effects in the host area. These include a temporary rise in local prices and, for some residents, improvements in daily convenience, such as enhanced transport services or local amenities during the event period.

54.65%of respondents reported greater daily convenience during the event, while the remainder did not notice a significant change. A short-term rise in local prices was observed by 82.72% and 89.8% believed the event's economic impact was evident, giving examples such as the increased revenue for domestic firms during race week.

Furthermore, 83.72% felt this event enhanced Shanghai's global image, reflecting strong public recognition.

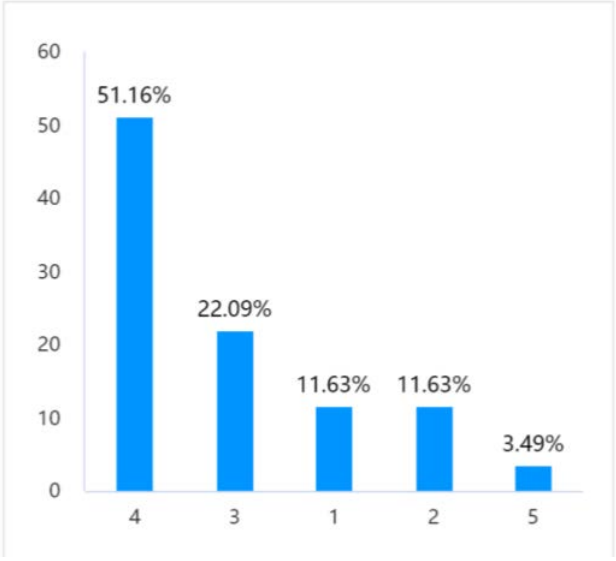

Figure3: Convenience benefits of the event

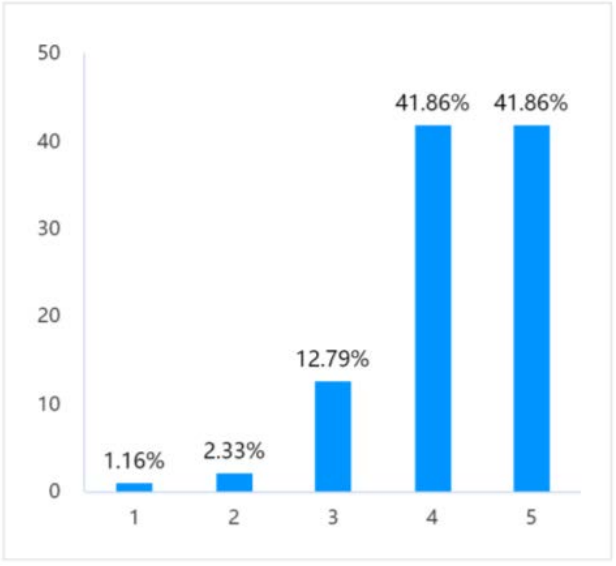

Figure 4: Perceptions of price increases during the event.

4.1.3 Willingness to Travel and Consume

Survey feedback indicates strong potential for the event to drive economic benefits and boost urban tourism. Among all participants, 72.73% were willing to travel to Shanghai for events such as races, concerts, and shows, whilst 85.95% expressed interest in visiting nearby scenic areas in addition to attending events. For those who did not attend the race the main reasons cited were lack of time (61.7%) and high ticket prices (34.04%). Overall, 88.7% of viewers stated they would visit Shanghai again due to a positive experience.

In terms of spending, 47.11% of respondents were willing to spend between ¥2,001 and ¥5,000 on a trip to Shanghai, suggesting a substantial potential audience and significant opportunities for increased tourism-related expenditure during race periods.

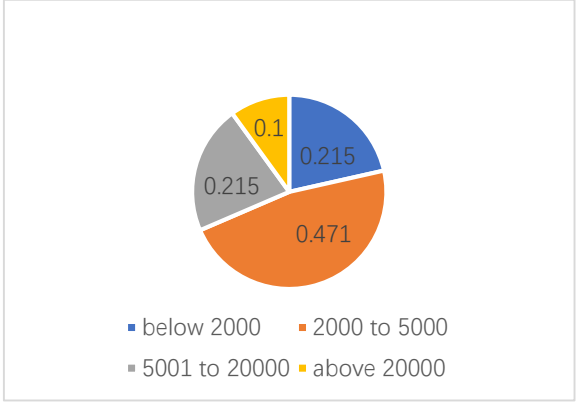

Figure 5: The amount respondents were willing to spend

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4.2 Public expectation and Feedback on Issues

4.2.1 Public Standard of a good racing

While factors such as opportunities to explore the city and good services enhance the overall experience, the quality of the whole race itself remains the most important factor. This was reflected in 96% of respondents ranking race quality as their top priority.

Figure 6: Factors influencing the experience of this trip

4.2.2 Existing Issues and Public Expectations

To fully understand the economic impact of the event, both positive outcomes and negative issues must be considered, as each influences the potential for long-term benefits.

The main concerns identified were 59.26%) and inefficient surrounding services (51.82%), followed by issues such as insufficient stock, uncomfortable venues, and high pricing. Noise was also mentioned as an area for improvement.

Respondents offered several suggestions, including opening the circuit to the public for free when no races are scheduled, establishing permanent racing-related shops, and increasing promotional activities.

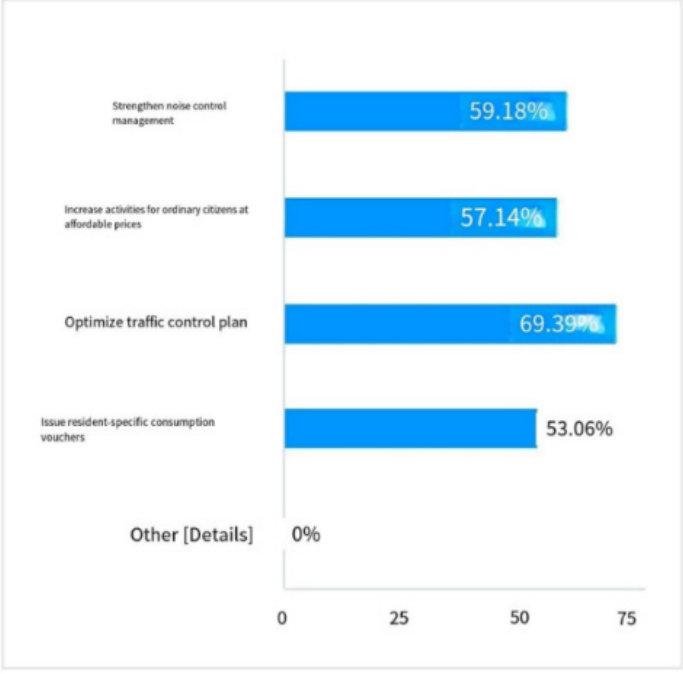

Figure7: issues shown by residents

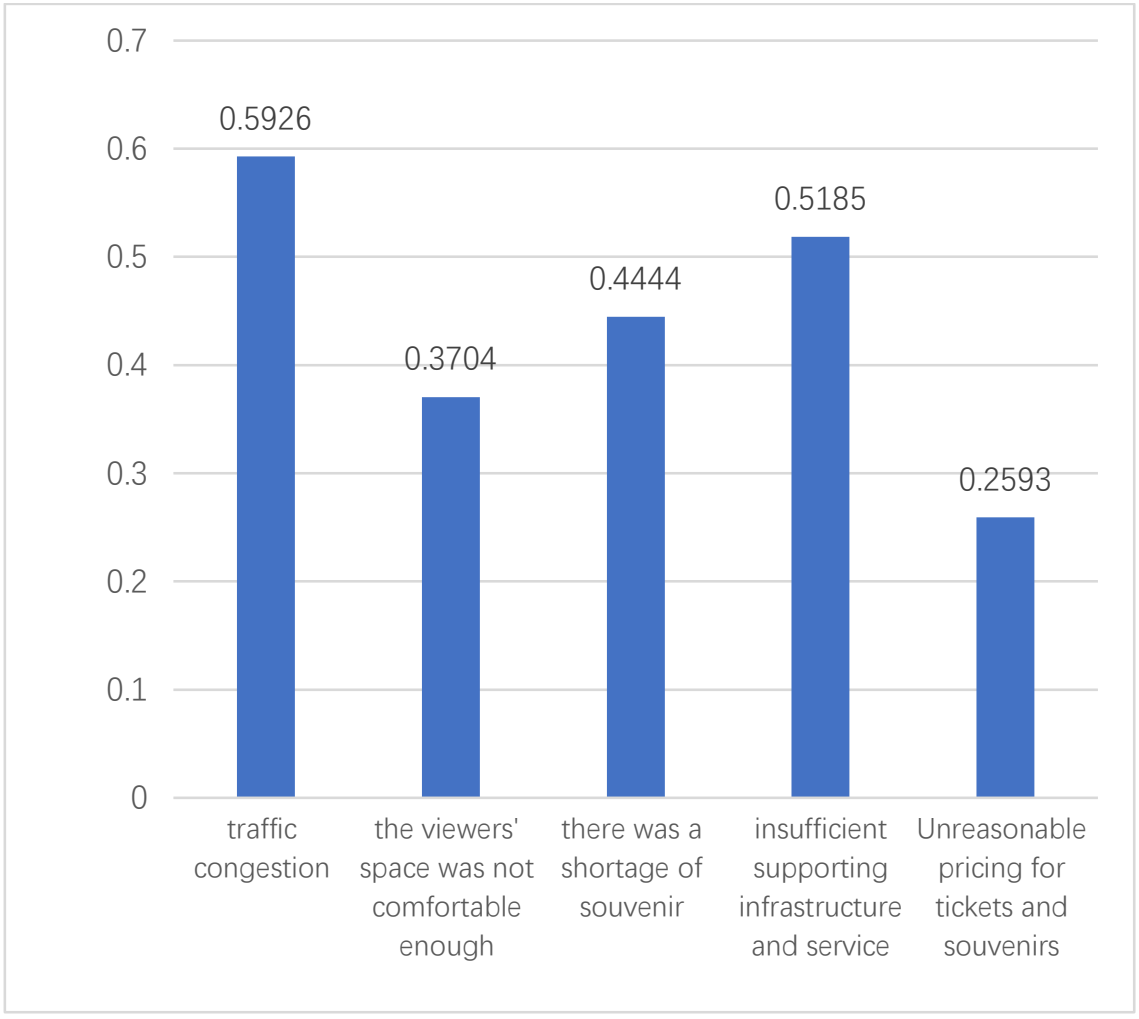

Figure8: issues shown by viewers

4.3 Multiplier Effect Calculation based on 2024 data

4.3.1 Overview

Assessing the event's economic impact using only the previously presented data – such as employment data, direct and indirect economic effects, tax revenue, audience numbers, and resident feedback- provides an incomplete picture. The next section applies Keynes' multiplier effect theory to estimate how consumption influences the local economy, as well as the leakage ratio to other regions and abroad.

4.3.2 Calculated theoretical data

The multiplier effect is used for quantifying F1's economic ripple effect in Shanghai, measuring both direct and indirect impacts.

Multiplier (K)=1/(1−*MPC*)

MPC calculation for Shanghai F1 (based on 2024 data)

Table 1: Calculated theoretical MPC

Index	Value （¥100 million）	Comments
New revenue from events	14.06	Direct economic impact
The local residents' consumption amount	9.8	Among the 1.593 billion spent on tourism, local residents accounted for 38%. While the cost for imports is 120 million
MPC	9.8/ 14.06≈0.697	Calculated

Multiplier (k) calculation

K=1/(1-MPC)=1/(1-0.697)≈3.12

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4.3.2 Calculated Actual Multiplier

Table 2: Calculated Actual Multiplier

Year	Viewer	Direct economic impact (￥100 million)	Gross Output Effect （￥100、million）	Multiplier （k）
2024	220,000	14.06	39.28	2.793

4.3.3 Leakage Ratio Calculation

Leakage ratio quantifies fiscal drainage from Shanghai's economy via international fees, imports, and overseas spending. It reduces the multiplier effect's local impact

Leakage rate = 1 - (Domestic retained economic revenue / Total economic revenue)

Local retained earnings = Direct economic impact - Outflow component (Outward payments + Import costs + International organization allocations)

Total economic benefit = Direct economic impact + Indirect economic impact

Table 3: Leakage Ratio Calculation

Direct economic impact （￥100 million）	14.06	Including tickets, on-site expenses, and revenue from the local
Indirect economic impact （￥100 million）	39.28	Including consumption derived from tourism, catering, transportation, and other industrial chains
International allocation rate	About 30%	Management fees, copyright fees, and overseas expenditures of the fleet (tax contribution in 2024: 137 million)
Imports and services	About 1.2	Including the import of souvenirs and the transportation of materials for overseas teams, etc.
Local retained earnings (billion yuan)	9.2	Calculation: Direct economic impact - (International share + Import cost)
Leakage ratio	34.6%	Calculation: 1 - (Local retained earnings / Direct economic impact)

5. Discussion

5.1 Overview

The results indicate that while the event generated significant positive economic impacts, concerns remain regarding residents well being. Theoretical calculations suggest that every yuan spent could produce an economic impact of 3.12 yuan; in practice the figure was 2.793 yuan due to a 34.6% leakage ratio.

The discussion examines the factors behind the gap between the theoretical and actual multiplier values. It also explores the contradictions of hosting this event, weighing its limitations, benefits, and opportunities. Finally, it offers recommendations to support sustainable development, enhance urban tourism and promote higher value spending.

5.2 Theoretical and Practical Discrepancies of the Multiplier Effect

The significant gap between the theoretical multiplier (K=3.12) and actual multiplier (K=2.793) observed in the Shanghai F1 Grand Prix stems from three fundamental limitations of the Keynesian model in globalized event economies.

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In " *Keynes at the periphery: Currency hierarchy and challenges for economic policy in emerging economies"*(2017), three professors demonstrated that the Keynesian multiplier theory assumes a closed economic

system, but in the context of globalisation, cross-border flows of capital and income are significant. Due to the currency hierarchy system in emerging economies, the currency liquidity premium is lower than that of developed countries, resulting in international income leakage (such as FIA licensing fees, overseas team splits). The literature indicates that financial globalisation has exacerbated this structural asymmetry, making it difficult for peripheral countries to fully capture the event revenue.

Firstly, the theory assumes a closed economy, whereas 34.6% of direct income leaked externally through: International outflows (30% of revenue to FIA licensing fees and overseas team operations), import dependencies, and cross-border expenditure (international spectators' airfares paid to non-local agencies).

Secondly, spatial factors are ignored. Traditional MPC calculations (0.697) only include spending actually in Shanghai, yet 80% spectators were non-residents whose post-event spending occurred outside Shanghai (e.g., Yangtze Delta tourism routes). This violates the model's "localized recycling" premise.

Thirdly, structural inefficiencies also lead to leakages; 72% of 9,857 jobs were temporary or low-skilled, limiting the amount of income re-spent locally and not improving the employment rate in the long term

5.3 The Contradictions of Urban of Tourism Impact

5.3.1 The contradiction between short-term explosive economic growth and long-term sustainable development

During the week-long F1 Shanghai Grand Prix, the hotel occupancy rate in Jiading District exceeded 95% and the footfall in the key commercial areas doubled. The influx of 200,000 visitors (in 2024) directly stimulated sectors such as accommodation, catering, and retail, generating an economic output of 3.928 billion yuan and contributing 10% to the whole year's economic effect brought by mega sports events. The event also created 9,857 job opportunities (such as security guards, logistics staff, and service personnel), accounting for 31.7% of the total employment contribution of sports events in Shanghai that year (compared with the employment data of all events in the city in 2024). This demonstrates the importance of the event to Shanghai, creating a substantial economic impact in the short term.

Although the event lasts only one week, it raises concerns about its sustainability. Nearly half of the audience (48.15%) were first-time attendees (see Result 4.1), suggesting an overreliance on this segment. Given that race quality is the most important factor influencing travel decisions, it may be difficult to attract these visitors back to Shanghai.

According to Pine and Gilmore's (1998) Experience Economic Theory, consumers are willing to pay a premium for immersive experiences. The high-priced ticket packages purchased by F1 fans, along with spending in luxury hotels and related shopping are clear examples manifestations of experiential consumption. This psychological premium allowed F1 to generate 10% of Shanghai's annual event-related economic effect in a single week, - evidence of the inherent unsustainability of short-term sports events.

The 34.6% of economic leakage ratio (as shown in Result 4.4.2) means that only 65.4 yuan out of every 100 yuan earned is retained locally, reducing the capacity for long-term investment.

Overall, while the Shanghai Grand Prix makes a significant economic contribution to the local community, the high leakage ratio, limited infrastructure capacity, and challenges in sustaining visitor numbers create uncertainties for future development.

5.3.2 The contradiction between economic growth and issues of citizens' livelihood

In 2024, the Shanghai Grand Prix generated ¥3.928 billion in economic impact, attracted 200,000 visitors, produced ¥137 million in tax revenue, and created 9,857 jobs. Hotel occupancy in Jiading reached 95% (regional average 65%), and commercial foot traffic doubled (see Section 4.1.2), highlighting the event's substantial economic benefits.

However, the visitor influx exceeded the community's carrying capacity. Traffic congestion affected 69.39% of residents (Figure 7), reflecting infrastructure unable to handle a crowd density of 44,000 people per km²—three times Shanghai's normal level. In Jiading, 59% of residents were affected, while only 23.26% reported added convenience, indicating reduced community support.

Actually, in "*Empirical Investigation on the Relationship between Social Welfare Improvement and Economic Growth*" (Feng,2014), By selecting the livelihood indicators in four sectors of our country, we constructed the livelihood indices for each sector, and using the decoupling theory, we examined whether there was a decoupling relationship between the livelihood indices and the GDP index in the period from 2002 to 2012. The empirical results show that the selected livelihood indices do indeed have a weak decoupling relationship with the GDP index, and this decoupling relationship has not shown a trend of reversal over time.

The 34.6% economic leakage exacerbates inequity by diverting funds from community compensation, despite 55% of residents demanding subsidized vouchers. Critically, Keynesian multiplier models (K=2.793) quantifying aggregate growth fail to capture these distributional injustices, contradicting China's "people-centered develop-

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ment" principle. Without embedded compensation mechanisms, such as allocating leakage-recaptured funds (e.g., localizing 50% souvenir production could reduce leakage 9%). For noise reduction infrastructure or resident dividend programs, the event's economic efficiency conflicts with social responsibilities, as livelihood grievances may escalate into community opposition to the event despite GDP gains.

This kind of structural leakage is similar to the predicament of the F1 circuit in South Korea. Despite investing 360 million US dollars in building the circuit, due to insufficient local operational capabilities, the post-race facilities have been left idle, and the annual maintenance costs amount to several billion Korean won. The total cost of the 2011 F1 Korean Grand Prix was 52 million pounds (with hosting fees and TV rights fees accounting for 35 million pounds), while the revenue (mainly from ticket sales) was approximately 16 million pounds. The deficit of over 30 million pounds was to be covered by the government(enorth.com). Consequently, this leakage directly weakens the investment multiplier effect. In the context of the economic leakage ratio (capital flight), the World Bank has highlighted that when capital flight exceeds 30% of a country's GDP over a sustained period, it significantly undermines domestic investment capacity and deters foreign capital inflows.

5.4 Recommendations for Sustainable Development

5.4.1 Core Strategies for Optimising the Economic Multiplier Effect

To increase the multiplier(k), with the aim of increasing the positive impact on the local society, it is crucial to reduce the leakage ratio.

The International Monetary Fund (IMF) highlighted in its 2017 research that optimizing fiscal expenditure structures, such as prioritizing budgetary spending and social welfare investments, can significantly enhance the fiscal multiplier effect, with China's multiplier rising from 0.75 to 1.4 during 2010–2015, demonstrating its positive impact on economic growth.

Local supply chains can also be developed, establishing a special fund to support the domestic production of racing car components and souvenirs (such as collaborating with automobile manufacturers in the Yangtze River Delta region), and reducing reliance on imports.

The marginal propensity to consume (MPC) can be increased through a more precise distribution of consumption vouchers. For out-of-town visitors (accounting for 78%), "event-tourism and culture co-branded consumption vouchers" could be issued, which are linked to hotels, restaurants, and local shopping (excluding imported goods)

5.4.2 Practical Approaches to Enhancing the Sustainability of Urban Tourism

To sustain continuous economic benefits, the existing infrastructures should be fully utilised and upgraded, with careful balancing of economic gains and citizens' well-being.

The race track space could be used year-round, hosting activities such as an "Automobile Culture Theme Park" with karting experiences and new energy vehicle test drives, generating continuous income during non-event periods.

Ningbo International Circuit has adopted diverse measures. It hosts various races like CEC, attracting numerous teams and drivers. During non-race periods, it brings in over 20 car manufacturers for commercial activities annually, including Volvo and Porsche. In addition, it has introduced more than 20 club enterprises. As a result, according to Ningbo Sports Bureau(2021)it draws about 240 million economic impact, creating 6911 job opportunities. In the future, there are at least 120 days when activities are held annually.

Furthermore, an affordable experience scenario could be introduced, launching a "spectator zone outside the competition venue offering low-price tickets and large-screen live broadcasts to attract new consumers who believe the price for the F1 is too high. Free public open days could also strengthen local identity, reduce noise complaints, and serve as a goodwill measure.

5.4.3 Policy upgrade and long-term guarantee

Government support is vital for industry growth and citizens well-being.

Investment transformation subsidies should be a priority, with the 2025 voucher programme (60 million yuan) upgraded to "industrial incubation vouchers", and subsidies also provided to local event service businesses (such as cleaning and logistics). This would ensure adequate supply during the event, create a positive visitor experience and support industry expansion.

A Social Welfare Compensation Mechanism could also be introduced, distributing noise compensation vouchers to Jiading residents , for use at participating merchants. Community representatives should be involved in the event planning meetings to discuss traffic and noise solutions, demonstrating social responsibility and transparency. Additionally, a dedicated "special event travel APP", integrating real-time bus services, shuttle buses, and shared bikes, could be introduced, while time-based traffic control could help reduce traffic congestion on event days.

In the community governance of Jiading District, Shanghai, it is clearly stipulated that the openness of resources should be "for public welfare", and it is allowed to reduce the participation costs of residents through forms such as insurance and preferential subsidies. The "Economic Compensation and Funding Mechanism for Noise Pollution Control" further proposes that the government can guide enterprises to participate in the compensation plan

through "monetary compensation, physical compensation" (such as consumption vouchers) and "tax preference" policies, forming diversified sources of funds. This provides an institutional framework for the implementation of "Noise Compensation Coupons".

6. Conclusion and Evaluation

This study examined the F1 Shanghai Grand Prix's economic impact on urban tourism, focusing on the multiplier effect. Key findings including theoretical (3.12) and actual (2.793) multipliers due to 34.6% leakage. While 78% non-local visitors boosted tourism, traffic/noise issues affected residents. Recommendations include localizing supply chains, targeted vouchers, and annual track use to balance growth and well-being. The study addresses gaps by combining multiplier theory with empirical data.

However, for limitations, sample size of questionnaires was small, meaning the result can not represent the whole population. And 2025 event data was unavailable, relevant literature on F1's economic effects was scarce and key data such as organizing costs was still inaccessible.

Future exploration can be continued, including expand sample size, cross-regional impact analysis, and develop methods to quantify intangible benefits such as city image.

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