

Concerts and local economic activity: a questionnaire survey of audience spending in Chinese host cities

Yixuan Xie

Suzhou Foreign Language School, Suzhou, China

bibi1000666@gmail.com

Abstract. Live music events have become a significant part of the urban experience economy, yet empirical evidence on how concert attendance translates into local economic activity remains concentrated in Western settings and at the macro level. This study examines the spending behavior of concert, music festival, tour and Livehouse audiences in Chinese host cities, and asks whether such events generate economic activity beyond ticket revenue. A cross-sectional design was adopted, and a structured questionnaire of forty-one items was distributed through purposive sampling combined with snowball sampling, yielding forty-one valid responses. Local off-ticket spending, defined as the sum of intra-city transport, accommodation, catering, merchandise, sightseeing and other shopping expenditure, serves as the principal dependent variable, and is supplemented by total expenditure and estimated new local spending. Descriptive statistics, Pearson and Spearman correlations, and ordinary least squares regression with HC3 robust standard errors were applied. Respondents reported mean local off-ticket spending of CNY 2,710.70 against a median of CNY 1,100, confirming a pronounced right-skewed distribution. Length of stay showed the most consistent positive association with local spending in both the correlation and the regression analyses, whereas fan intensity, monthly disposable amount, non-local status and price sensitivity did not reach conventional levels of significance. The findings suggest that the duration of an audience member's stay, rather than travel distance or fan identity alone, is the more proximate mechanism through which performances stimulate local consumption. Given the small sample and the self-reported amounts, the results are interpreted as associational rather than causal.

Keywords: experience economy, concert tourism, local off-ticket spending, length of stay, audience consumption behavior

1. Introduction

With the rise of the global experience economy, concerts and live music events are no longer simply regarded as cultural entertainment phenomena, but are increasingly becoming a topic of growing academic interest.

Based on the above literature, it can be found that the existing research still has shortcomings in the following aspects: first, most of the research focuses on the Western contexts, particularly European and North American contexts, and the empirical research on the economic impact of concerts in the Chinese context is relatively limited; second, the existing research mostly measures the overall economic effect of activities at the macro level, and rarely discusses the driving factors from a micro-level perspective focusing on individual

consumption behavior. Third, the variable of "fandom intensity" has not been fully tested empirically in the research on consumer behavior.

Through a questionnaire survey of Chinese concert audiences, this study combines the micro-level analysis of individual consumption behavior with the macro-level discussion of urban economic effects, which fills the above research gap to a certain extent and offers academic and practical implications.

2. Theoretical framework

2.1. Experiential economic theory

The "experience economy" theory proposed by Pine and Gilmore [1, 2] is the core theoretical framework for understanding the consumption behavior of modern concerts. The two scholars pointed out that after the commodity economy and service economy, consumers are increasingly willing to pay a premium for unique and emotionally engaging experiences rather than just buying physical products or standardized services. As a typical experiential consumer good, concerts offer high levels of audience participation, emotional resonance and scarcity (the non-replicability of live performances), so they can drive consumers to spend beyond planned budgets. This theory directly explains why consumers are willing to pay high fees for accommodation, transportation and merchandise other than tickets, which is the theoretical basis for the micro-consumption behavior analysis of this study.

2.2. Demand theory and consumer behavior

From the perspective of standard microeconomics, concert tickets and related consumption are normal goods or even luxury goods, and demand is influenced by price, income, preferences and other factors. The expenditure allocation decisions of consumers can be explained by the budget constraint theory: in the case of limited disposable income, consumers will make trade-offs between different consumption items. Existing studies have shown that for groups with strong fan loyalty, concert consumption is inelastic, that is, price increases do not significantly reduce their willingness to spend [3].

2.3. The impact of concerts and large-scale events on local economy

2.3.1. *Direct economic effect*

According to Oxford Economics [4], the live performance industry in the United States alone had a direct economic impact of about \$55.2 billion in 2019, including venue operating expenses and off-site spending by out-of-home audiences. In particular, the report points out that for every \$100 spent on tickets by out-of-town visitors, the local economy receives about \$300 of additional supporting consumption, which fully demonstrates the importance of spending beyond tickets.

Saayman and Saayman [5] conducted a systematic study on the economic impact of cultural activities, emphasizing that the audience's expenditure on accommodation, catering, transportation and retail accounted for a substantial proportion of the event's economic impact, rather than the ticket revenue itself. This finding is consistent with the design of using "local off-ticket spending" as the proxy variable for local economic impact in this study.

2.3.2. *Multiplier effect and indirect economic impact*

The academic research on the economic effect of concerts generally adopts the "economic multiplier" framework to measure the diffusion effect of initial consumption in the local economy.

According to the research report of OECD [6], cultural, sports and commercial activities can all drive employment, retail and tourism revenues in host places through multiplier effects, but the actual size of the multipliers varies significantly depending on city size, activity type and research method.

2.3.3. Regional economic cases of music festivals and concerts

Kruger and Saayman [7] conducted field surveys on the audience of several music festivals in South Africa and found that different audience segments (based on music preference, travel motivation and demographic characteristics) had significant differences in the amount and structure of consumption. Among them, the total consumption of music-oriented visitors is significantly higher than that of social-oriented visitors. Getz [8], on the basis of systematically reviewing the literature on event tourism, pointed out that music festivals and concerts, as periodic anchor events, can periodically create predictable tourism flows and consumption increases for host cities.

2.4. Audience consumption behavior and expenditure structure

2.4.1. Expenditure patterns of audiences at music events

Thrane's [3] survey on the audience of Norwegian jazz festivals is one of the classic empirical studies in this field. The study found that the audience's music interest, travel distance and accommodation mode are key predictors of total expenditure, of which overnight visitors from other places spend significantly more per capita than local visitors who return on the same day.

The study of Saayman et al. [9] further revealed the influencing mechanism of consumer demographic characteristics (age, income and family structure) on activity-related expenditures, and found that disposable income and frequency of participation in activities were the strongest positive predictors, which was consistent with the design of taking income level and frequency of attending performances as independent variables in this study.

2.4.2. Consumption differences between local audiences and non-local audiences

The structural difference in consumption behavior between local and non-local audiences is a core issue in the assessment of the economic impact of events. Crompton et al. [10] clearly pointed out in their methodological guide that "new spending" and "substitution spending" must be distinguished when assessing the net contribution of activities to the local economy: The consumption of local residents often only transfers to activities the consumption that would otherwise occur in other local venues, and the net incremental contribution to the local economy is limited; spending by non-local audience members represents the new "input" demand in the real sense, which is the core source of the economic effect of the event.

2.4.3. Fans' psychology and willingness to pay

From the perspective of behavioral economics, the decision-making process of music consumption is significantly driven by emotional value. Research by Linan et al. (cited in [11]) shows that Consumers' emotional identification with a specific artist and fan identity will significantly increase their willingness to pay a price premium, which is reflected in their willingness to pay prices far beyond the standard utility for concert-related consumption (merchandise, VIP seats, cross-city travel, etc.).

2.5. Analysis of spillover effect and substitution/new consumption at the city level

2.5.1. Spillover consumption and urban economic vitality

The existing literature generally agrees that large-scale concerts have significant short-term spillover effects on the catering, accommodation, transportation and retail industries of the host cities by attracting the influx of non-local audiences. According to data from an industry report by Oxford Economics [4], more than 50% of

the economic benefits of a live performance event come from supporting spending outside the venue rather than box office revenue itself.

2.5.2. Controversy over substitution effect and net economic contribution

However, some researchers are more cautious about the net economic benefits of large-scale events. Crompton [12] and Baade and Matheson [13] both stressed that the economic impact assessments of many activities suffer from systematic overestimation. The main reasons include: substitution spending by local residents is not fully excluded, the "crowding out effect" (that is, ordinary tourists reduce their visits due to crowds during the event) is ignored, and multiplier effects are overestimated.

3. Method

This study investigates the potential impact of concerts, festivals, tours and Livehouse performances on economic activity in host cities using a cross-sectional quantitative research design with a structured questionnaire as the main data collection tool.

3.1. Questionnaire design

The formal questionnaire consists of 41 questions, including eight parts: screening questions, demographic information, performance experience, travel situation, consumption amount, new and alternative consumption, attitude scale and open questions. The questionnaire mainly used numeric open-ended questions, categorical selection and five-point Likert scale. The Likert-scale items were rated on a scale from 1 to 5, where 1 represents the lowest degree or "strongly disagree" and 5 represents the highest degree or "strongly agree" [14].

3.2. Sample and data collection

The target group for this study was audience members who attended at least one offline concert, festival, tour or Livehouse performance in the last 24 months. The first question of the questionnaire was set as a screening question; respondents who had not participated in relevant activities had their responses excluded from subsequent analyses. Purposive sampling combined with snowball sampling was used in the study. The questionnaire was distributed through classmates, friends, and social platforms such as Xiaohongshu, Weibo and Douban. Snowball sampling enabled the researchers to reach additional participants with similar performance experience through existing participants, but this is a non-probability sampling method, so the research results are mainly used to explain the variable relationship within the sample and do not directly infer the overall characteristics of all concert audiences [15].

The first page of the questionnaire explained the study purpose to participants, the anonymous nature of the survey, and the use of data. Participation was entirely voluntary and respondents could stop answering at any time. The questionnaire does not collect information that can directly identify individuals, such as names, ID numbers, contact details or precise addresses. A total of 50 questionnaires were collected in the study, and 9 questionnaires that did not meet the screening conditions, were missing key variables, were obviously repeated and had serious logical contradictions were excluded, and finally 41 valid questionnaires were obtained with an effective rate of 82.0%.

3.3. Variable measurement

The core dependent variable of this study is "local consumption outside tickets". This variable is obtained by summing expenditure on intra-city transportation, accommodation, catering, merchandise, tourism clocking,

shopping and other consumption, as defined in Equation (1):

$$\text{Local consumption outside ticket} = Q24 + Q25 + Q26 + Q27 + Q28 + Q29 \quad (1)$$

The measure defined in Equation (1) excludes spending on tickets and intercity transport. Ticket revenue may not remain entirely within the host city, and intercity transportation expenditure may also flow to airlines, railway operators and other interregional transport providers.

This study constructs two supplementary dependent variables simultaneously. First, the total expenditure is the sum of eight categories of expenditure from Q22 to Q29, including tickets, intercity transportation and all local consumption. Second, the new local consumption is calculated by multiplying the local consumption outside the ticket price by the proportion of new consumption reflected in Q31. The five intervals of Q31 are converted to their midpoint values of 10%, 30%, 50%, 70% and 90%, respectively.

The core independent variables include the degree of fans, monthly disposable amount, non-local audience status, travel distance, number of days to stay and price sensitivity. Fan degree is measured by Q13; the monthly disposable amount is recorded by Q9; the code for non-local audience is 1, and the code for local audience is 0; travel distance in kilometers; days of stay were recorded by Q19; price sensitivity is measured by Q41.

3.4. Data sorting and quality control

Data cleaning mainly includes range checking, logic checking and outlier checking. The scale items must be between 1 and 5; in principle, the cross-city distance of local visitors should be 0; the number of nights and accommodation expenditure of those who did not stay overnight should be 0; the amount of all kinds of consumption shall not be negative. For extreme consumption values, this study first judges whether they have reasonable explanations by combining itemized expenditure and open questions. Only values clearly caused by input errors are corrected or eliminated, and true but high consumption records are retained, and robustness tests are carried out by log transformation when necessary.

Although Q35–Q43 were all measured using five-point scales, the items measured different constructs such as willingness to pay, additional consumption tendency, willingness to visit a city, experience value, perception of economic impact, price sensitivity and social media influence, so they are not directly added to a single attitude total score.

3.5. Data analysis

Descriptive statistics were first conducted to report the age, gender, education level, type of performance, local or out-of-city status of the sample, as well as the mean, median, standard deviation, minimum and maximum of each type of consumption.

Secondly, Pearson correlation coefficient was used to test the linear relationship between the degree of fans, monthly disposable amount, attendance frequency, travel distance, stay days, price sensitivity and consumption outcomes. Correlation analysis was performed using a two-tailed test with the significance level set at $\alpha = 0.05$ and the correlation coefficient r and p -values reported simultaneously. Scatter plots, outliers, and variable distributions were examined before Pearson correlation analysis. Since the single-item Likert questions are ordered variables in nature, the research should be cautious when using them for parametric analysis. If the distribution of variables is seriously skewed or there are obvious outliers, Spearman rank correlation is used for robustness comparison [16].

Finally, multiple linear regressions were performed using ordinary least squares. The main model is specified in Equation (2):

$$\begin{aligned} LocalOff - ticketSpending = & \beta_0 + \beta_1 FanIntensity + \beta_2 Income + \beta_3 Non - local \\ & + \beta_4 TravelDistance + \beta_5 StayDuration + \beta_6 PriceSensitivity + \varepsilon \end{aligned} \quad (2)$$

Before regression analysis, multicollinearity, residual linearity, homoscedasticity, residual approximate normality and abnormal influence points among variables were checked. The multicollinearity is judged by the variable correlation matrix and variance inflation factor, and the residual plot is used to check whether the linear relationship and error variance are basically stable. Correlations and regression coefficients are only used to illustrate statistical associations between variables and are not interpreted as strictly causal effects.

4. Results and discussion

4.1. Data screening and cleaning results

A total of 50 questionnaires were returned in this study. Firstly, the sample is selected according to the first question of the questionnaire, "whether you have participated in offline concerts, music festivals, tours or Livehouse performances in the past 24 months". A total of nine respondents answered "no", which did not meet the preset target sample conditions for this study, and therefore were not included in the subsequent statistical analysis. Finally, 41 valid questionnaires were retained, with an effective rate of 82.0%. It should be noted that the "valid questionnaire" here means that the respondents meet the basic conditions of the research object, which does not mean that there is no missing in all numerical variables in each questionnaire.

Among the 41 valid samples, 34 respondents were classified as out-of-town or cross-city audiences, accounting for 82.9%; the number of local viewers was 7, accounting for 17.1%. In the original questionnaire, some respondents' judgment on "whether the performance city is the same as the city of permanent residence" is inconsistent with the city or travel distance they fill in. For example, although individual respondents selected "local audience", the performance city was obviously different from the city of permanent residence, and the information of cross-city distance and accommodation was filled in. In order to reduce classification errors, this study comprehensively compared the performance city, permanent city, travel distance and original options, and re-coded the three records with obvious contradictions.

Secondly, some numerical questions in the original questionnaire were filled in a non-standard form and could not be directly used for statistical analysis. In order to maintain the consistency of the treatment rules, this study uniformly converts the monetary unit into CNY, the distance into kilometers, and the time into hours. For interval data, the midpoint of the interval is used as the estimator. For the consumption amount question, this study specifically distinguishes between "zero consumption" and "unknown consumption". This distinction is important because miscoding the unknown amount as 0 systematically underestimates the average consumption level of the audience. For individual consumption records filled in foreign currency, they shall be converted into CNY when the currency unit is clear, and the conversion assumption shall be indicated in the data cleaning table.

Of the 41 valid questionnaires, a total of 37 questionnaires had complete data on non-ticket local consumption and 35 questionnaires had complete data on total expenditure. After further considering regressors such as fan degree, monthly disposable amount, audience type, travel distance, length of stay and price sensitivity, 32 complete samples were finally used in the main regression model. The difference in the sample size used in different analyses is because this study adopts the complete case analysis, that is, the respondent is entered into the corresponding calculation only when all the variables involved in a certain analysis are not missing.

From the perspective of data quality, the original data reflect that some respondents do not fully fill in accurate values according to the requirements of the questionnaire, especially the questions of monthly disposable amount, travel distance, stay time and consumption amount.

4.2. Descriptive statistical results and discussion

4.2.1. Basic characteristics of the sample

Table 1 presents the basic characteristics of the valid sample. The respondents ranged in age from 13 to 36, with a mean age of 18.71 and a median age of 17, indicating that the sample mainly focused on teenagers and young consumers. In terms of gender distribution, there were 37 female respondents, accounting for 90.2%; there were 4 male respondents, accounting for 9.8%.

In terms of education level, there are 21 respondents in technical secondary school or senior high school, accounting for 51.2%; A total of 16 respondents were junior college or undergraduate, accounting for 39.0%; 3 junior high school students, accounting for 7.3%; one master or doctoral candidate, accounting for 2.4%. The average monthly disposable amount of the sample is CNY 3,841.53, the median is CNY 2,250, but the standard deviation reaches CNY 5,260.97, and the highest value is CNY 30,000, indicating that the consumption power of different respondents varies greatly.

Table 1. Basic characteristics of the valid sample

Sample features	Category	Frequency/value	Percentage
Valid sample	—	41	100.0%
Gender	Female	37	90.2%
	Male	4	9.8%
Level of education	Junior high school students	3	7.3%
	Secondary school/high school students	21	51.2%
	Junior college/Undergraduate	16	39.0%
	Master/Doctor candidate	1	2.4%
Audience type	Local audience	7	17.1%
	Out-of-town/cross-city audience	34	82.9%
Age	Mean value	18.71	—
	Median value	17	—
Monthly disposable amount	Mean value	3,841.53	—
	Median value	2,250	—

In terms of the location of the performance, there are 34 non-local or cross-city audiences, accounting for 82.9% of the sample, while there are only 7 local audiences, accounting for 17.1%. In terms of the type of performance, the largest number of respondents, 19 or 46.3%, attended the most recent concert in a large stadium; 8 people for medium-sized concert or theater performances, accounting for 19.5%; the number of Livehouse performances was 7, accounting for 17.1%; music festival 5, accounting for 12.2%; other types accounted for 2 persons or 4.9%. This indicates that the results of this study mainly reflect the consumption impact of large or medium-sized commercial performances, while for smaller scale independent performances or other cultural events, the sample coverage is relatively limited.

In the past 12 months, respondents attended an average of 3.15 offline performances, with a median of 2. The average score of fan degree is 4.46, the average score of performance attraction is 4.49, and the average

score of cross-city or additional spending intention is 3.95. The three scores are all higher than 3 points, the median value of the five-point scale, indicating that the sample has a high degree of love for artists and willingness to participate in performances.

4.2.2. Performance related consumption structure

Table 2 presents the various types of consumption of the respondents when they last attended the performance. The ticket expenditure of all 41 respondents is available, with the average ticket expenditure of CNY 1,515.05 and the median of CNY 1,080, which is a relatively stable and common expenditure among single consumption. Shopping and other spending, excluding tickets, had the highest mean value of CNY 924.21, but the median was only CNY 100; the average value of travel and clocking consumption is CNY 405.90, and the median value is CNY 0; the mean value of accommodation expenditure is CNY 504.20, and the median value is CNY 0. This shows that there is a clear right-skewed distribution of some consumption items: most respondents have low consumption or do not generate this consumption, but a small number of viewers incur very high shopping, travel or accommodation expenditures, thus raising the average value substantially.

Table 2. Consumption structure of the last performance

Category of consumption	Effective <i>N</i>	Average value (CNY)	Median (CNY)	Standard deviation (CNY)
The Ticket	41	1,515.05	1,080	1,619.98
Intercity transportation	39	583.85	150	1,010.83
Transportation within the city	40	105.48	50	175.62
Accommodation	40	504.20	0	969.89
Food and beverage	39	393.05	300	531.39
Merchandise for sale	41	293.66	180	417.74
Travel, clocking or scenic spot spending	39	405.90	0	1,594.18
Shopping and other consumption	38	924.21	100	3,242.57
Total expenses	35	4,902.66	2,820	6,223.78
Local consumption outside tickets	37	2,710.70	1,100	5,209.73
New local consumption	37	1,504.39	720	2,691.56

The mean value of intercity transportation expenditure is CNY 583.85, and the median is CNY 150, indicating that although cross-city visitors generally need to bear additional transportation costs, the transportation modes and travel distances of different visitors vary greatly. The average expenditure on inner-city transportation is only CNY 105.48, which is the lowest among all kinds of consumption items. The average of catering expenditure is CNY 393.05, and the median is CNY 300, which is close to the mean, indicating that catering consumption is more common than tourism and shopping expenditure, and its distribution is relatively stable. The average value of merchandise expenditure is CNY 293.66, and the median is CNY 180, reflecting that some fans will regard artist-related goods as an important part of the performance experience.

Among the 35 questionnaires with complete data, the mean value of the total expenditure related to the latest performance was CNY 4,902.66, and the median value was CNY 2,820. The mean is about CNY 2,083 higher than the median, further indicating that total consumption is affected by a small number of high-spending viewers. The mean value of local spending outside of tickets was CNY 2,710.70 and the median was

CNY 1,100. Even if tickets and intercity transportation are not considered, the audience will still generate considerable spending on accommodation, catering, transportation, shopping and tourism in the performance city (as shown in Figure 1). Figure 2 further compares the median consumption of local and non-local audiences.

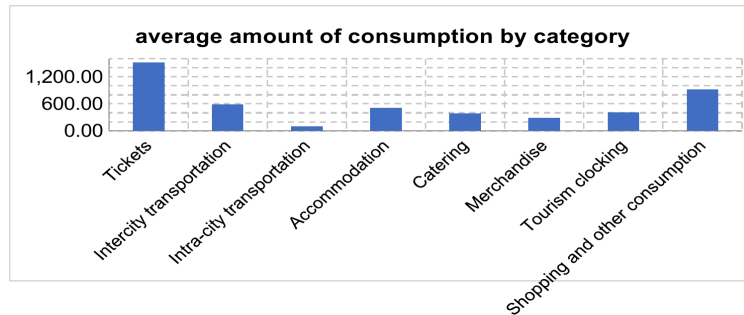


Figure 1. Mean of various performance-related consumption

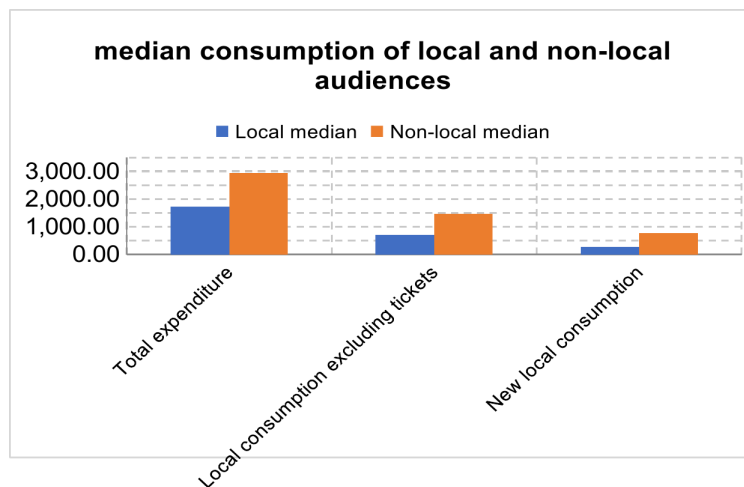


Figure 2. Median consumption of local and non-local audiences

Based on the respondents' judgment on the proportion of new consumption, the average value of new local consumption estimated by this study is CNY 1,504.39, and the median value is CNY 720. This result suggests that not all local consumption should be considered as new demand created by the performance, but the performance may still trigger a portion of urban consumption that would not otherwise occur. However, this indicator, calculated from the respondents' self-estimated proportion, is a subjective approximation and cannot be interpreted as a precise contribution of the performance to the local economy. Cross-city visitors may continue to incur spending on accommodation, catering, intra-city transportation, shopping and tourism after entering the host city.

4.2.3. Attitude scale results

Table 3 shows the descriptive statistical results of the nine attitude questions. The item with the highest average score is "large-scale concerts, music festivals or tours can drive local consumption of food, transportation, accommodation and tourism", with a mean score of 4.46 and a median score of 5. This indicates that the majority of respondents agree that performances have local economic spillovers. Secondly, "Concerts are not only entertainment, but also a social or lifestyle experience" has a mean score of 4.37,

indicating that audiences buy not only tickets to the show, but also the atmosphere, fan identity, social interaction, and urban experience.

Table 3. Descriptive statistical results of attitude questions

Attitude item	Mean	Median	Standard deviation
Willing to pay more for the artists you like	4.24	4	0.70
The show incurs additional costs beyond the ticket price	4.02	4	0.85
The performance made me more willing to visit a city	3.80	4	0.98
A performance is a social or lifestyle experience	4.37	4	0.66
The show can drive local food, transport, accommodation and tourism	4.46	5	0.67
Out-of-town audiences are more likely to bring in additional consumption	4.20	4	0.81
Rising costs will reduce the number of shows I go to	3.44	3	0.98
Social media content will increase the willingness to attend performances across cities	3.22	3	1.21
The live experience made me willing to bear the extra transportation and accommodation costs	3.98	4	0.72

The average score of willing to spend more money on the artists they like is 4.24, and the average score of non-local audiences is 4.20 for bringing additional consumption to the cities where they perform. The audience's emotional investment in the artist may increase the willingness to pay, while the non-local audience is more likely to generate additional consumption such as transportation, accommodation and tourism.

The average score of "attending concerts usually leads to additional consumption in addition to tickets" is 4.02, and the average score of "live experience makes me willing to bear additional transportation and accommodation costs" is 3.98, which also supports that performance consumption has the characteristics of experience economy. Rather than making decisions based solely on ticket prices, audiences may view transportation, accommodation, and other expenses as the overall cost of a complete live experience.

In contrast, price sensitivity has a mean score of 3.44, which is close to but slightly above the median. This means that the rising cost will affect the performance decision-making of some respondents, but there are obvious individual differences in the impact. The social media influence item has the lowest mean of 3.22 points with a standard deviation of 1.21, which is also the most divisive item. This shows that social media, clocking content and sharing with friends have a strong influence on some audiences, but it is not the main reason for all respondents to attend performances across cities.

4.3. Correlation analysis and robustness test

4.3.1. Pearson correlation analysis results

Due to a small number of missing values for different variables, the effective sample size for correlation analysis in each group ranged from 33 to 37. Table 4 shows the Pearson correlation coefficients and two-tailed *p*-values between each explanatory variable and local consumption outside of tickets. The results show that travel distance and days of stay are significantly and positively related to local consumption outside of tickets, while the correlations of the other variables do not reach the 5% level of statistical significance.

Table 4. Correlation analysis of each variable with local consumption outside of tickets

Variables of interest	Effective <i>N</i>	Pearson <i>r</i>	Two-tailed <i>p</i> -value	Spearman ρ	Two-tailed <i>p</i> -value
Degree of fandom	37	0.247	0.140	0.225	0.181
Monthly disposable amount	35	-0.014	0.937	0.022	0.902
Frequency of attendance in the past 12 months	37	-0.044	0.794	0.236	0.160
Whether it is a foreign audience	37	0.161	0.342	0.240	0.152
Travel distance	33	0.576	< 0.001	0.269	0.131
Days of stay	36	0.586	< 0.001	0.685	< 0.001
Sensitivity to price	37	-0.045	0.793	-0.180	0.286
Cross-city or additional willingness to spend	37	0.095	0.576	0.306	0.066
Attraction of performance	37	0.209	0.215	0.165	0.329
Willingness to bear additional transportation and accommodation costs	37	0.170	0.315	0.225	0.181

Note: All *p*-values are the results of two-tailed tests.

In the Pearson analysis, travel distance is moderately positively correlated with local consumption outside ticket prices, with a correlation coefficient of 0.576 and a two-tailed *p*-value less than 0.001. This means that in the sample of this study, the further away the audience lives from the performance city, the higher the consumption of transportation, accommodation, catering, peripheral areas, tourism and shopping in the city.

However, the Spearman rank correlation coefficient between travel distance and local consumption is only 0.269 with a *p*-value of 0.131, which does not reach the level of statistical significance. The inconsistency between the Pearson and Spearman results suggests that the significant linear relationship between distance and consumption may be affected by the small number of long distance and high consumption samples. For example, part of the audience who went to Seoul, Tokyo, or other distant cities to see the show simultaneously generated high spending on accommodation, dining, and shopping, and these records may have improved the Pearson correlation coefficient.

In contrast, the relationship between the number of days of stay and out-of-ticket local consumption is more stable. Pearson correlation coefficient was 0.586, *p*-value was less than 0.001; the Spearman rank correlation coefficient is further increased to 0.685, and the *p*-value is also less than 0.001. Both correlation methods show a significant positive correlation, indicating that the longer the audience stays in the performance city, the higher the generated out-of-ticket local consumption is generally.

There is a weak positive correlation between the degree of fans and local consumption, with a Pearson correlation coefficient of 0.247, but a *p*-value of 0.140, which does not reach the level of statistical significance. This implies that viewers with a higher degree of fan following may have a higher propensity to spend, but the current sample is not sufficient to confirm this relationship.

There is almost no correlation between monthly disposable amount and local consumption, and the Pearson correlation coefficient is -0.014 and the *p*-value is 0.937. The Pearson correlation coefficient between the frequency of attendance in the past 12 months and local consumption is -0.044, which is close to zero with a *p*-value of 0.794. However, the Spearman correlation coefficient is 0.236, and the direction is positive, which still does not reach the statistical significance level. This difference in direction may indicate that the relationship between the frequency of attending a performance and single consumption is not simply linear.

The identity of non-local audience is weakly positively correlated with local consumption, and the Pearson correlation coefficient is 0.161 and the p -value is 0.342. The Spearman correlation coefficient is 0.240, and the p -value is 0.152. Although the descriptive statistics show that the median consumption of out-of-town visitors is higher than that of local visitors, the correlation analysis fails to confirm a significant relationship between "out-of-town identity" and the amount spent. The Pearson correlation coefficient between price sensitivity and local consumption outside tickets is -0.045 , and the p -value is 0.793, indicating that there is almost no obvious linear relationship between the two.

The Pearson correlation coefficient between cross-city or additional consumption intention and local consumption is 0.095, and the p -value is 0.576, which does not reach the significant level. The Spearman correlation coefficient is 0.306, and the p -value is 0.066, which is close to but not yet at the significant level of 0.05. This may indicate that, independent of the extreme consumption amount, the audience with higher cross-city consumption intention has a tendency to have a higher local consumption class. However, due to the sample size, this trend is not enough to form a stable conclusion.

The two variables of performance attraction and "willingness to bear additional transportation and accommodation costs for on-site experience" are positively correlated with local consumption, but the correlation coefficients are only 0.209 and 0.170 respectively, with p -values higher than 0.05.

4.3.2. Core variable correlation matrix

Table 5 presents the Pearson correlation matrix between the core explanatory variables and local consumption outside tickets.

Table 5. Pearson correlation matrix of core variables

Variables of interest	1	2	3	4	5	6	7	8
1. Degree of fans	1.000							
2. Monthly disposable amount	-0.081	1.000						
3. Frequency of attendance	0.160	0.059	1.000					
4. Out-of-town audiences	0.027	-0.211	-0.132	1.000				
5. Travel distance	0.253	-0.131	-0.144	0.375*	1.000			
6. Length of stay	-0.104	-0.010	0.279	0.307	0.379*	1.000		
7. Price sensitivity	-0.144	-0.131	-0.078	-0.062	-0.124	-0.194	1.000	
8. Local consumption outside ticket price	0.247	-0.014	-0.044	0.161	0.576***	0.586***	-0.045	1.000

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively. All significance tests are two-tailed. The effective sample sizes for different correlation coefficients vary due to missing values.

The correlation matrix shows that there is a significant positive correlation between being a non-local audience and the travel distance, with a correlation coefficient of 0.375 and a p -value of 0.022. This indicates that out-of-town audiences usually need to travel to the performance city from more distant locations, which is in line with the actual meaning of the variable. However, the correlation coefficient between the two is not very high, which may be due to the fact that some cross-city audiences come from nearby surrounding cities, and some re-coded non-local audiences have a relatively limited travel distance although they cross cities.

There is also a significant positive correlation between travel distance and days of stay, with a correlation coefficient of 0.379 and a p -value of 0.021. This means that more distant audiences are more likely to extend their stay in the city of performance.

There is no high correlation close to 0.80 or above between fan degree, income, attendance frequency, out-of-town status, travel distance, stay days and price sensitivity. Therefore, from the correlation matrix, serious multicollinearity problems are unlikely to occur when these variables are subsequently put into the linear regression model at the same time.

4.3.3. Robustness results and discussion

Due to the obvious right-skewed distribution of the amount of local consumption outside tickets and the five-point scale used for some variables, this study further used Spearman rank correlation as a robustness test.

The most important finding of the robustness test is that the positive association between days of stay and local consumption reaches a highly significant level in both Pearson and Spearman analyses. The Pearson correlation coefficient is 0.586, and the Spearman correlation coefficient is 0.685, which are in the same direction. This shows that the relationship between the length of stay and consumption is not only caused by a few samples with high consumption, but also relatively stable in the overall ranking of the samples.

In contrast, travel distance, although significant in the Pearson analysis, was not significant in the Spearman analysis. This difference indicates that the relationship between distance and consumption may not be uniform and linear. The difference in spending between short- and medium-distance audiences may not be apparent, with only a few long-distance or multinational audience members generating particularly high spending on accommodation, dining and shopping. Therefore, the paper cannot assert that "the longer the travel distance is, the higher the consumption must be".

4.4. Multiple linear regression analysis

4.4.1. Model setting

The main model uses "local consumption outside tickets" as the dependent variable. The estimated specification is given in Equation (3):

$$\begin{aligned} LocalSpending = & \beta_0 + \beta_1 Fan + \beta_2 Income + \beta_3 Nonlocal \\ & + \beta_4 Distance + \beta_5 Stay + \beta_6 PriceSensitivity + e \end{aligned} \quad (3)$$

Where, in Equation (3), (Fan) represents the degree of fans; (Income) represents the monthly disposable amount and is expressed in units per CNY 1,000; (Nonlocal) is the dummy variable of audience identity, which is coded as 1 for non-local audience and 0 for local audience; (Distance) represents the travel distance and is expressed in units of 100 kilometers; (Stay) represents the number of days spent in the city of performance; (PriceSensitivity) indicates price sensitivity, and the higher the score is, the more likely the respondents are to reduce their attendance due to rising costs.

Given the small sample size, significantly right-skewed consumption amount distribution, and the presence of a few high consumption records, this study uses HC3 robust standard errors to correct coefficient significance while reporting ordinary least squares regression results to reduce the impact of outliers and error variance instability on statistical inference.

4.4.2. Results of the main regression model

As Table 6 shows, the main model as a whole reaches the statistical significance level ($F = 5.356$, $p = 0.001$). The R^2 of the model is 0.562, and the adjusted R^2 is 0.457. This means that the six variables of fan degree, monthly disposable amount, audience identity, travel distance, length of stay and price sensitivity jointly explain about 56.2% of the variance of out-of-ticket local consumption in the sample; after considering the number of variables and sample size, the model can still explain about 45.7% of the difference in consumption.

Table 6. Multiple linear regression results of local consumption outside tickets

Explanatory variables	Coefficient of regression	HC3 Robust standard error	<i>t</i> value	<i>p</i> -value	95% Interval of confidence	VIF
Constant term	-2,953.69	4,449.18	-0.664	0.513	[-12,116.95, 6,209.56]	—
Degree of fandom	804.27	760.20	1.058	0.300	[-761.39, 2,369.92]	1.40
Monthly disposable amount (per CNY 1,000)	21.47	28.40	0.756	0.457	[-37.03, 79.97]	1.11
Out of town audience	-248.56	645.01	-0.385	0.703	[-1,576.99, 1,079.87]	1.32
Travel distance (per 100 km)	214.92	207.86	1.034	0.311	[-213.17, 643.01]	1.37
Days of stay	881.32	444.57	1.982	0.059	[-34.28, 1,796.92]	1.27
Sensitivity to price	-138.41	450.35	-0.307	0.761	[-1,065.92, 789.10]	1.28

Note: Dependent variable is local consumption excluding tickets; ($N = 32$). *p*-values and confidence intervals are based on HC3 robust standard errors. All tests are two-tailed.

Among the six explanatory variables, the number of days of stay shows the most obvious positive effect. Its regression coefficient is 881.32, which means that after controlling the degree of fans, income, non-local identity, travel distance and price sensitivity, every additional day of stay of the audience in the performance city will increase the local consumption outside the ticket price by about CNY 881 on average. This variable has a robust *p*-value of 0.059, slightly above the traditional 0.05 significance criterion, but below 0.10, which can be considered borderline significant.

This indicates that the length of stay may be an important mechanism for performances to drive local consumption. The longer visitors stay, the more likely they are to increase the number of nights of accommodation, meals, intra-city transport activities, and travel and shopping opportunities.

However, the 95% confidence interval of the length of stay ranges from CNY -34.28 to CNY 1,796.92, and the interval still contains 0, indicating that there is great uncertainty in the actual impact degree. Therefore, the study can consider that the length of stay shows a strong positive trend, but it is not yet possible to confirm its stable independent effect at the 5% significance level.

The regression coefficient of travel distance is 214.92, indicating that when the travel distance increases by 100 kilometers, the local consumption increases by about CNY 215 on average. However, the robust *p*-value of this variable is 0.311, which does not reach the level of statistical significance. This is different from the significant results in the Pearson correlation analysis.

The previous bivariate analysis shows that there is a significant positive correlation between travel distance and local consumption; however, after controlling both the number of days of stay and other variables in the regression, the independent effect of distance is no longer significant. This suggests that the relationship between distance and consumption may arise partly through length of stay. Viewers who are farther away usually need to stay longer, and it may be the act of staying, rather than the distance itself, that really leads directly to accommodation, dining and tourism spending.

Therefore, this study cannot simply conclude that "every 100 km increase in travel distance will necessarily increase local consumption".

The regression coefficient of fan degree is 804.27 with a positive direction, which means that when other variables are the same, the local consumption increases by about CNY 804 on average for every one-point increase in fan degree. However, the p -value is 0.300, and the 95% confidence interval also includes 0, indicating that the current sample cannot confirm that the degree of fans has a stable independent impact.

The fact that the fan degree does not reach a significant level may be related to the fact that the score distribution of the sample is too concentrated. In this study, the average degree of fanship is 4.46 points, and most respondents choose 4 or 5 points, with small differences in variables. When most of the participants in the sample are fans with a high degree, it is difficult for the statistical model to identify the difference in consumption caused by different levels of fandom. In addition, the degree of fandom may more directly affect the expenditure on tickets and merchandise, while the dependent variables in this model also include accommodation, catering, transportation, tourism and shopping, so its impact may be diluted by other consumption items.

The coefficient of monthly disposable amount is 21.47, which means that for every CNY 1,000 increase in monthly disposable amount, local consumption only increases by about CNY 21 on average, and the p -value is 0.457, which does not reach the significant level. This result is consistent with the correlation analysis that the monthly disposable amount filled out by the respondents cannot effectively explain their actual local consumption during the performance.

One possible reason is that the sample consists mainly of students. Although some respondents reported low personal monthly disposable amounts, cross-city transportation, accommodation, or tickets may be extra covered by their parents. Therefore, the monthly disposable amount of an individual does not fully represent the performance budget that his family can provide. At the same time, some respondents have vague estimates of the disposable amount, which will also reduce the explanatory power of this variable.

The regression coefficient of the non-local audience variable is -248.56, and the p -value is 0.703, which does not reach the level of statistical significance. The negative direction of the coefficient should not be interpreted as an indication that out-of-town viewers consume less than local viewers. The descriptive statistics actually show that median local consumption is higher for out-of-town viewers than for local viewers. The regression coefficient turns negative, which is obtained after controlling for both distance and length of stay. This means that the higher consumption of nonlocal visitors may not be directly caused by the "nonlocal identity" itself, but because nonlocal visitors usually travel farther and stay longer, and are more likely to incur accommodation and tourism expenditures. When these specific behavioral variables are included in the model, pure local or nonlocal classifications no longer have additional explanatory power. Since the coefficient is far from reaching the significant level, its positive and negative directions do not have stable substantive significance.

The coefficient of price sensitivity is -138.41, which is in line with the theoretical expectation that more price-sensitive respondents may generate slightly lower local consumption, but its p -value is 0.761, indicating that the relationship is very unstable. Price sensitivity may mainly affect whether consumers attend a performance or which ticket price to choose, and the samples in this study are all audience members who have already attended the performance. Therefore, price sensitivity may not be a valid explanation for actual accommodation, dining, or travel expenditures among people who have already made a performance decision.

4.4.3. Model diagnosis

In terms of multicollinearity, the variance inflation factors of the six explanatory variables are all between 1.11 and 1.40, far lower than the commonly used judgment standards. This indicates that there is no serious linear overlap between the degree of fandom, income, out-of-town identity, distance, days of stay and price sensitivity, and multicollinearity is not the main reason for the insignificance of the variables.

The p -value of Breusch-Pagan test is 0.630, and no obvious heteroscedasticity problem is found. However, the Jarque-Bera normality test p -value of the residuals is 0.008, indicating that the residuals fail to meet the strict assumption of normal distribution. This result is consistent with the clearly right-skewed features of the consumption data. A few cross-country, long-distance, or high-spending viewers spend significantly more than other respondents, skewing the distribution of residuals.

The impact point analysis also shows that the Cook's distance of some high-consumption samples exceeds the reference value of $(4/N)$. These records are not necessarily false data, but may be real cross-border attendance or high travel costs. Therefore, this study does not simply delete these samples, but adopts HC3 robust standard errors, and further carries out robustness tests by log transformation of the dependent variable.

4.4.4. Robustness test of logarithmic model

In order to reduce the impact of right-skewed and extreme values of consumption amount, this study further re-estimates the model with $\ln(\text{local consumption outside ticket price} + 1)$ as the dependent variable. As Table 7 shows, the R^2 of the logarithmic model is 0.416, and the adjusted R^2 is 0.276, and the overall model reaches the level of statistical significance ($F = 2.968, p = 0.025$).

Table 7. Results of the log-model of local consumption outside of tickets

Explanatory variables	Regression coefficient B	HC3 Robust standard error	p -values
Degree of fandom	0.808	0.537	0.145
Monthly disposable amount (per CNY 1,000)	0.046	0.046	0.325
Out of town audience	0.393	0.944	0.681
Travel distance (per 100 km)	0.032	0.069	0.647
Days of stay	0.743	0.376	0.059
Sensitivity to price	0.380	0.449	0.405

In the logarithmic model, the coefficient of days of stay is still positive, and the p -value is 0.059, which is completely close to the original amount model. The log coefficient of 0.743 implies that a one-day stay is associated with a higher level of local consumption, other variables being constant. Converted exponentially, the coefficient roughly corresponds to an increase in local consumption of about 110%, but with a p -value just above 0.05 and a wide confidence interval, this percentage can only be taken as an exploratory estimate and cannot be considered a precise overall effect. The other variables still did not reach the 0.05 level of significance in the logarithmic model. Out-of-town identity turns positive in the logarithmic model but remains insignificant, which also indicates that the direction of the coefficient of this variable is sensitive to the model form and cannot be substantially explained.

5. Conclusion

This study focuses on the core issue of "whether live music events such as concerts and tours can promote local economic activities in the host city", and tries to explore how cultural events generate economic spillover effects through audience consumption behaviors.

This study mainly draws the following three conclusions. First, concerts can form obvious extra-ticket consumption effects. Although ticket revenue is usually an important indicator to measure the economic value of a performance, this study finds that the audience's consumption of accommodation, catering, transportation, shopping and tourism in the host city also constitutes an important economic contribution. Out-of-town

audiences, in particular, usually have higher consumption demands due to their need to move across cities. According to the descriptive statistics, the median out-of-town consumption of tickets for non-local visitors is CNY 1,450, which is higher than CNY 700 for local visitors. This shows that cross-city performance attendance has the potential to promote the diffusion of urban consumption. Second, length of stay is an important mechanism linking performance activities with the local economy. The correlation analysis shows that there is a significant positive correlation between the number of stay days and the local consumption outside the ticket, with the Pearson correlation coefficient being 0.586 and the Spearman correlation coefficient being 0.685, indicating that this relationship is not entirely caused by the extreme consumption samples. In the regression analysis, the length of stay is also the closest explanatory variable to being significant, with a coefficient of CNY 881.32 per day. Third, traditional demographic characteristics and consumption intention variables have limited explanatory power for the actual amount of consumption. Although the degree of fans, income level and price sensitivity may theoretically affect consumer behavior, none of these variables reached the statistical significance level in the regression model of this study. This shows that whether the audience really generates high local consumption does not completely depend on whether they are deep fans or have a high income level, but is more affected by the actual travel arrangement and urban stay behavior.

In the past, the discussion on the economic value of concerts often focused on ticket sales, venue revenue or the number of visitors, but paid less attention to the internal formation mechanism of audience consumption behavior. This study further shifts the focus of research from "whether the performance makes money" to "how the performance affects urban economic activities" by distinguishing the three indicators of total expenditure, local consumption outside tickets and new local consumption.

Although this study provides some empirical evidence, several limitations remain. Firstly, the sample size is small. In this study, 41 valid questionnaires were finally used for analysis, and the valid samples of the regression model were further reduced to 32. Secondly, there is some deviation in the sample structure. There is a high proportion of female audience in the effective sample, and a large proportion of non-local audience. This may result in the research results more reflecting the consumption characteristics of young female fans and cross-city audiences, and cannot be fully generalized to all ages, genders and audience types. Thirdly, the consumption data in this study mainly come from respondents' self-reports, and some of the amounts are recall estimates rather than precise data based on consumption records. Therefore, some cases of high or low consumption may be affected by memory bias. At the same time, the index of "new local consumption" depends on the respondents' subjective judgment on whether the consumption would have occurred if there had been no performance, so it can only be used as an approximate estimate. Finally, this study uses cross-sectional questionnaire data, which can only identify statistical relationships between variables, but cannot strictly prove causality. For example, a longer stay may promote consumption, or it may be that viewers who originally planned to travel and spend more actively chose to extend their stay. Therefore, the results should be understood as evidence of relevant mechanisms rather than deterministic causal effects.

For city managers, the economic value brought by concerts should not only focus on box office revenue, but on how to improve the length of stay of audiences in the city. Compared with simply increasing the number of performances, it may be more effective to expand the economic impact of cultural activities by creating a comprehensive model of "performance + tourism", "performance + commercial consumption" and "performance + urban experience". For the performance organizers, they can improve the consumption possibility of the audience in the host city by providing transportation plans, accommodation cooperation, urban tourism route recommendation and fan consumption experience activities. For future research, the sample size can be further expanded and analyzed by combining different cities, different types of

performances and real consumption data. At the same time, future research can use longitudinal data or case comparison methods to further explore how concert scale, city hierarchy, tourism resources and policy support jointly affect the economic effects of cultural activities.

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