

The Unequal Distribution of Tourism's Bounty: A Quantitative Analysis of Tourism Resources and Income Inequality in CHINA

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Abstract. This study quantitatively investigates the relationship between tourism resource development and urban-rural income inequality in China from 2005 to 2022. While tourism is frequently promoted as a strategic tool for regional development and poverty alleviation, its distributional effects remain ambiguous. Diverging from studies that rely on demand-side metrics like visitor arrivals, this research utilizes panel data from Chinese provinces to distinguish between the endowment of tourism resources (rated scenic spots) and economic flows. We specifically examine the impact of resource quality by differentiating between high-grade (A4-A5) and low-grade (A1-A3) scenic areas. Contrary to the pro-poor tourism hypothesis which posits tourism as an equalizer, our empirical results utilizing two-way fixed effects and instrumental variable strategies indicate that the aggregate quantity of tourism resources exerts a statistically significant positive effect on the urban-rural income gap. Specifically, tourism development behaves as a mechanism of "disequalizing growth," raising overall income levels but disproportionately benefiting urban centers over rural peripheries. Furthermore, we identify significant spatiotemporal heterogeneity: the inequality-widening effect is most pronounced in the economically developed Eastern region and intensified significantly following the 2008 global financial crisis. These findings suggest that without targeted redistributive policies and supply-chain linkages, the mere development of tourism infrastructure—particularly capital-intensive high-grade sites—may exacerbate rather than alleviate the urban-rural divide.

Keywords: Tourism Resources; Income Inequality; Urban-Rural Income Gap; Quantitative Analysis; Panel Data.

1. Introduction

Tourism has established itself as a paramount global industry and a robust engine for economic growth, contributing substantially to national and regional economies worldwide ^[1]. In the context of China, the tourism sector has undergone remarkable expansion, evolving into a strategic pillar industry and a crucial driver of development, particularly in regions lagging in traditional industrialization ^[2]. Policy narratives frequently laud tourism for its potential to generate employment, stimulate local economies, and alleviate poverty through the "trickle-down" effect ^[3]. However, juxtaposed against these aggregate economic gains are persistent concerns regarding the distributional impacts of tourism revenue. Scholars have increasingly questioned whether the industry exacerbates existing socio-economic inequalities ^[4-6]. The central tension lies in the uneven spatial distribution of tourism resources and the varying capacities of different regions—and distinct populations within those regions—to capitalize on tourism opportunities. Consequently, the "bounty" of tourism may be unequally distributed, posing significant challenges for achieving balanced regional development.

Income inequality, particularly the structural urban-rural income gap, remains a formidable challenge in China despite decades of rapid economic growth ^[7]. While tourism development is frequently advocated as a mechanism to bridge this gap by fostering inclusive development in rural areas—where many scenic assets are located—empirical evidence regarding its efficacy is mixed ^[8]. Divergent literature suggests two opposing outcomes: one strand argues that tourism acts as an

equalizer by creating non-agricultural employment in rural peripheries^[9], while another contends that benefits concentrate in urban centers due to superior capital and infrastructure, leading to economic ‘leakage’ and widening disparities^[10,11]. This dichotomy necessitates a more nuanced understanding of how the foundational assets of the industry—tourism resources themselves—influence income distribution dynamics.

Existing literature has extensively explored the relationship between general resource distribution (natural, human, financial) and income inequality^[12-13]. However, within tourism studies, the prevailing focus has been on aggregate outcome indicators such as visitor arrivals or total tourism revenue^[5, 14]. There remains a notable gap concerning the direct and differentiated impacts of tourism resources—specifically their quantity, quality (grade), and spatial layout—on income inequality. Understanding the role of these foundational assets is critical because, unlike fluid visitor flows, tourism resources are geographically fixed and require specific, often massive, capital investments. These characteristics inherently influence the subsequent flow of economic benefits along the tourism value chain.

This paper departs from traditional revenue-based assessments to investigate the structural mechanisms driving distributional outcomes. By shifting the analytical focus from downstream outcomes (revenue/arrivals) to upstream inputs (tourism resources), this study makes three distinct theoretical and empirical contributions to the literature.

First, we distinguish between the flow of visitors and the stock of tourism resources. While visitor arrivals are frequently used as a proxy for tourism development, they are susceptible to short-term demand shocks and do not reflect the capital investment structure of the destination. By utilizing the inventory of rated scenic areas, we provide a more robust measure of supply-side capacity that is directly amenable to policy intervention. Second, we deconstruct the heterogeneity of tourism assets. Existing studies often treat tourism as a monolithic industry; however, we argue that high-grade, capital-intensive sites (4A-5A) have fundamentally different economic footprints than low-grade, community-accessible sites (1A-3A). This differentiation allows us to test the "enclave" hypothesis with greater precision. Third, we employ a rigorous instrumental variable (IV) strategy using lagged resource data to address endogeneity, providing causal evidence on whether the spatial layout of tourism resources acts as an equalizer or an entrenchment of existing urban-rural hierarchies.

2. Literature Review

This study situates itself at the intersection of development economics and tourism geography. We review the literature progressing from the general impacts of resource distribution on inequality to the specific distributional mechanisms within the tourism industry.

2.1 Spatial Disparities in Resource Distribution and Income Inequality

Economic geography posits that income inequality is fundamentally rooted in the spatial mismatch of core production factors: natural resources, infrastructure, labor, and capital^[12,15]. Regions endowed with abundant resources and integrated infrastructure networks can efficiently access global markets, attracting technology and capital, which mitigates macro-level inequality. Conversely, regions lacking these complementarities face high circulation costs and limited employment diversification, exacerbating income disparities^[13].

These mechanisms are acutely relevant to tourism. Although natural or cultural tourism resources are often geographically fixed in rural or peripheral areas, their commercialization requires complementary mobile resources—capital for hotels, skilled labor for management, and transportation infrastructure. The uneven distribution of these complementary factors across China creates a disconnect^[16]. Urban centers, possessing superior infrastructure and service capacity, are often better positioned to capture the value generated by rural attractions^[17]. Consequently,

resource-rich but infrastructure-poor rural regions may struggle to convert tourism assets into local economic gains.

Furthermore, disparities in human and financial capital amplify this dynamic. Regions with high educational resources attract skilled talent, enhancing productivity and income, while peripheral regions suffer from "brain drain" and low-skilled labor retention^[18,19]. Similarly, the concentration of financial resources in urban centers creates a "siphon effect," where capital flows from resource-scarce to resource-abundant regions seeking higher returns^[20,21]. In the tourism context, this suggests that even if a rural area possesses a high-quality scenic spot, the financing and ownership are likely to originate from urban centers, leading to the repatriation of profits and a "financial repression" of the local host community^[22].

2.2 Tourism Development and Income Distribution

The academic debate regarding tourism's impact on income distribution is characterized by two contrasting narratives: the "pro-poor" growth hypothesis and the "core-periphery" dependence model.

Proponents of tourism as a development tool argue that the industry reduces inequality by diversifying rural economies and creating non-agricultural employment^[2,3,23]. From this perspective, tourism allows rural residents to monetize local assets—landscape, culture, and handicrafts—thereby narrowing the gap with urban incomes.

However, a critical body of literature suggests that achieving equitable distribution is structurally difficult. Grounded in spatial differentiation theory, scholars argue that urban areas serve as tourism "gateways" or "cores," benefiting from agglomeration economies^[24,25]. Rural areas, serving as the "periphery," may become marginalized, providing the scenic backdrop while the economic value is captured by urban-based tour operators, hotels, and transport providers^[11,26]. This leads to a widening urban-rural income gap^[27].

In China, this inequality is institutionalized through the 'Standard of Classification and Evaluation of Quality Grades of Tourist Attractions' (GB/T 17775-2003). Achieving high-grade status (5A or 4A) requires meeting rigorous criteria regarding transportation access, sanitary infrastructure, and visitor centers. These requirements necessitate massive capital investments that rural communities typically lack. Consequently, high-grade development is often dominated by state-owned enterprises (SOEs) or large urban developers. This ownership structure facilitates a 'fly-over' effect where tourists visit rural sites but their spending on accommodation, dining, and transit occurs in urban hubs, or revenue is repatriated to urban headquarters^[29,30]. This effectively creates tourism "enclaves" where the physical resource is rural, but the economic function is urban.

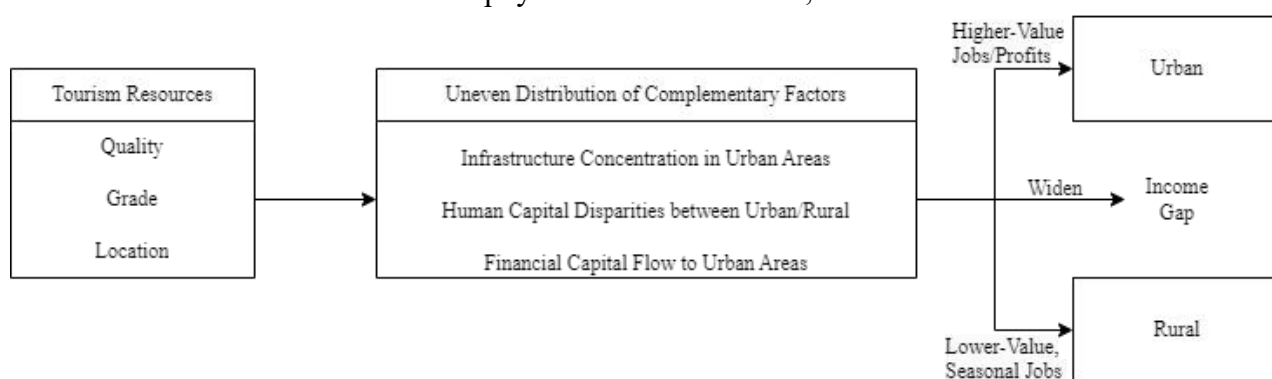


Fig.1 Conceptual Model of Tourism Resource Development and Income Inequality

We propose a conceptual model (Figure 1) where tourism resources act as foundational assets. Their impact is mediated by the unequal distribution of complementary resources (infrastructure, human capital). This interaction creates a "siphon effect," causing economic leakage from rural to urban areas. This mechanism has likely intensified in China post-2008, following the national

strategy to boost domestic consumption through large-scale infrastructure and high-speed rail investments, which favored urban connectivity and capital-intensive tourism projects^[30].

While studies utilizing Gini coefficients^[5], Social Accounting Matrices^[31], and CGE models have confirmed that tourism can exacerbate inequality, few have integrated the specific grade and quality of tourism resources into a unified framework^[32]. By distinguishing between types of attractions, we can better understand how different forms of tourism investment differentially impact the urban-rural divide.

Despite these extensive debates, a critical gap remains in the methodological approach to measuring tourism's impact. The majority of existing studies rely on demand-side metrics, such as total tourism revenue or visitor arrivals^[5,14]. While these indicators capture economic flow, they fail to account for the structural characteristics of the destination's development model. Revenue data does not distinguish between income generated by local family-run guesthouses versus income captured by large, urban-owned resort enclaves. Consequently, the literature lacks a clear understanding of how the quality and grade of the tourism infrastructure itself influences distribution. This study addresses this oversight by analyzing the grade-specific endowment of scenic areas, thereby linking the physical capital intensity of the tourism sector directly to income inequality outcomes.

2.3 Hypotheses Development

Based on the competing perspectives of trickle-down benefits versus enclave development, and considering the specific capital-intensive nature of China's rated scenic areas, we formulate the following hypotheses:

2.3.1 Hypothesis 1 (Urban-Rural Income Gap)

The density of tourism resources significantly affects the urban-rural income gap. Specifically, an increase in the stock of scenic areas is expected, on average, to be associated with a widening of the income disparity between urban and rural residents, due to urban capture of value-added services.

2.3.2 Hypothesis 2 (Heterogeneity by Resource Quality)

The distributional impact varies by resource quality. High-grade (4A/5A) scenic areas, being more capital- and infrastructure-intensive, are expected to exert a stronger inequality-widening effect than low-grade (1A–3A) scenic areas, which may be more accessible to local, smaller-scale entrepreneurship.

Consistent with the growth literature, we also anticipate that tourism resource development will positively impact absolute levels of both rural and urban income, even while potentially exacerbating the relative gap.

3. Methodology

3.1 Data Sources and Variable Construction

To rigorously test the proposed hypotheses, this study employs a balanced panel dataset encompassing 31 provinces, municipalities, and autonomous regions in mainland China over the period 2005–2022. The data are sourced from the China Statistical Yearbook, the Yearbook of China Tourism Statistics, and the database of the National Bureau of Statistics.

The variables are constructed as follows (see Table 1):

3.1.1 Dependent Variable (Income Inequality):

We utilize the Urban-Rural Income Gap ($\ln income$), measured as the natural logarithm of the absolute difference between urban per capita disposable income and rural per capita net income. While the ratio is often used, the absolute gap reflects the magnitude of welfare disparity. We also

examine $\ln_{\text{rural}}$ (rural income), $\ln_{\text{urban}}$ (urban income), and pgdp (per capita GDP) to decompose the effects on growth versus distribution.

3.1.2 Independent Variables (Tourism Resources)

We use the inventory of A-level scenic areas as a proxy for tourism resources. This is a supply-side measure reflecting established tourism capacity and investment. We decompose this into:

A5: High-grade scenic areas (4A and 5A ratings). These represent world-class or national-level attractions requiring high capital investment.

A3: Low-grade scenic areas (1A, 2A, and 3A ratings). These are typically regional attractions with lower entry barriers for development.

A: The total number of rated scenic areas.

All resource variables are log-transformed to reduce skewness.

3.1.3 Control Variables:

We control for pgdp (economic development level), STR (industrial structure, measured as the ratio of secondary to tertiary industry output), and gpeo (population growth rate). These variables account for the broader macroeconomic and demographic context that influences income distribution.

Table 1. Variable Descriptions and Constructions

Variable Type	Definition	VarName	Construction
Dependent	Urban-Rural Income Gap	$\ln_{\text{income}}$	$\ln(\text{Urban Income} - \text{Rural Income})$
	Rural Per Capita Income	$\ln_{\text{rural}}$	$\ln(\text{Rural Per Capita Income})$
	Urban Per Capita Income	$\ln_{\text{urban}}$	$\ln(\text{Urban Per Capita Income})$
Independent	Low-Grade Scenic Areas	A3	$\ln(\text{Count of 1A-3A scenic areas})$
	High-Grade Scenic Areas	A5	$\ln(\text{Count of 4A-5A scenic areas})$
	Total Scenic Areas	A	$\ln(\text{Total count of A-level scenic areas})$
Control	Economic Level	pgdp	$\ln(\text{Per Capita GDP})$
	Industrial Structure	STR	Secondary Industry Value / Tertiary Industry Value
	Population Growth	gpeo	Annual population growth rate (%)

3.2 Descriptive Statistics

Table 2 summarizes the descriptive statistics. The mean of $\ln_{\text{income}}$ is 9.417 with a standard deviation of 0.766, indicating persistent and varying inequality across provinces. The distribution of tourism resources is highly uneven; the mean log-value of low-grade scenic areas (A3) is 0.235, while high-grade (A5) is 0.140, but the maximum values indicate that some provinces possess a dense concentration of tourism assets.

Table 2. Descriptive Statistic Results

VarName	Obs	Mean	SD	Min	Median	Max
$\ln_{\text{income}}$	4985	9.417	0.766	7.012	9.505	10.805
$\ln_{\text{rural}}$	4985	9.138	0.666	7.171	9.216	11.194
$\ln_{\text{urban}}$	4985	10.021	0.525	8.515	10.088	11.339
pgdp	4985	10.040	2.231	7.800	10.495	12.456
A3	4985	0.235	1.213	0.000	0.000	30.000
A5	4985	0.140	0.736	0.000	0.000	19.000
A	4985	0.371	1.774	0.000	0.000	36.000
STR	4985	1.090	0.799	0.000	1.051	10.706
gpeo	4985	4.469	7.017	0.000	3.660	293.51

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

Visualizing the data via choropleth maps (Figure 2) reveals a positive spatial correlation: provinces with high concentrations of scenic areas (particularly high-grade ones) tend to overlap with regions exhibiting higher economic development levels (Eastern and Central China). Preliminary visual inspection also suggests these regions maintain significant urban-rural income disparities, providing initial support for our hypothesis.



Fig.2 Choropleth Map of Tourism Resources, Economic Development, and Population Distribution in China

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

3.3 Model Specification and Estimation Strategy

We adopt a two-way fixed effects (FE) model to mitigate omitted variable bias. This approach controls for time-invariant province-specific characteristics (such as geography and historical culture) and time-varying national shocks (such as macroeconomic policies or the COVID-19 pandemic).

The baseline estimation equation is:

$$Y_{it} = \alpha_0 + \beta_1 Resource_{it} + \gamma_1 STR_{it} + \gamma_2 gpeo_{it} + \mu_i + \lambda_t + \epsilon_{it}$$

Where Y_{it} represents the dependent variables ($\ln income$, $\ln rural$, $\ln urban$, $\ln pgdp$) for province i in year t . $Resource_{it}$ denotes the tourism resource variable (A, A3, or A5). μ_i and λ_t represent province and year fixed effects, respectively.

3.3.1 Addressing Multicollinearity

A significant correlation exists between the count of high-grade and low-grade scenic areas within provinces (correlation > 0.7). To avoid multicollinearity which creates unstable coefficient estimates, we estimate separate regressions for A3, A5, and total A. This allows us to isolate the marginal effect of each resource tier.

3.3.2 Addressing Endogeneity (IV Strategy)

While fixed effects control for unobserved heterogeneity, potential reverse causality remains a concern (e.g., wealthier provinces may invest more in scenic areas). To address this, we employ an instrumental variable (IV) strategy using one-period lagged tourism resource measures

($L.A3, L.A5, L.A$) as instruments for current values. Past infrastructure investment is a strong predictor of current stock (relevance) but is determined prior to current income shocks (exogeneity), consistent with dynamic panel literature (Bellemare et al., 2017).

4. Results

This section details the empirical findings, progressing from baseline fixed-effects models to endogeneity corrections and heterogeneity analyses.

4.1 Baseline Regression Results

The baseline results using the fixed effects estimator are reported in Tables 3 through 5. Across all specifications, the results consistently indicate that tourism resource endowment is a significant predictor of income dynamics.

4.1.1 Impact of Low-Grade Scenic Areas (A3)

Table 3 reveals that low-grade scenic areas have a statistically significant positive effect on the urban-rural income gap. The coefficient for A3 on $\ln\text{income}$ is 0.0443 ($p < 0.01$). This implies that a 1% increase in the number of low-grade attractions is associated with a 0.0443% increase in the absolute income gap. Importantly, A3 resources positively impact both rural (0.0699) and urban (0.0552) incomes. This confirms that while tourism promotes growth in both sectors, it does not necessarily narrow the gap between them.

Table 3. The Impact of Low-grade Scenic Areas (Fixed Effects)

VARIABLES	(1)	(2)	(3)	(4)
	$\ln\text{income}$	$\ln\text{rural}$	$\ln\text{urban}$	pgdp
A3	0.0443***	0.0699***	0.0552***	0.0367*
	-0.00579	-0.00712	-0.00589	-0.0202
STR	-0.295***	-0.450***	-0.357***	-0.328***
	-0.0118	-0.0145	-0.012	-0.041
gpeo	-0.00608***	-0.0109***	-0.00805***	-0.0165***
	-0.00095	-0.00117	-0.000967	-0.00331
Constant	9.755***	9.660***	10.43***	10.46***
	-0.0146	-0.0179	-0.0148	-0.0508
Id	yes	yes	yes	yes
Province Fixed Effects	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes
Observations	4,985	4,985	4,985	4,985
R-squared	0.141	0.208	0.192	0.021

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

4.1.2 Impact of High-Grade Scenic Areas (A5)

Table 4 presents the results for high-grade resources. The coefficient for A5 on $\ln\text{income}$ is 0.0828 ($p < 0.01$), which is nearly double the magnitude of the coefficient for low-grade areas. This strongly supports Hypothesis 2: high-grade, capital-intensive tourism development exerts a more powerful disparity-widening effect. While A5 resources significantly boost rural income (0.1270.127) and urban income (0.1000.100), the resultant structural dynamic widens the absolute inequality. The impact on per capita GDP is also robustly positive (0.1000.100, $p < 0.05$), confirming the sector's contribution to aggregate economic growth.

Table 4. The Impact of High-grade Scenic Areas (Fixed Effects)

	(1)	(2)	(3)	(4)
VARIABLES	lnincome	lnrural	lnurban	pgdp
A5	0.0828***	0.127***	0.100***	0.100**
	-0.0114	-0.0141	-0.0116	-0.0398
STR	-0.295***	-0.451***	-0.357***	-0.327***
	-0.0118	-0.0145	-0.012	-0.041
gpeo	-0.00628***	-0.0112***	-0.00831***	-0.0167***
	-0.000951	-0.00117	-0.000968	-0.00331
Constant	9.755***	9.661***	10.43***	10.46***
	-0.0146	-0.018	-0.0149	-0.0508
Id	yes	yes	yes	yes
Province Fixed Effects	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes
Observations	4,985	4,985	4,985	4,985
R-squared	0.14	0.205	0.19	0.022

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

4.1.3 Impact of Total Scenic Areas (A)

Table 5 corroborates the findings using the aggregate measure. The total stock of scenic areas positively correlates with the income gap ($\beta = 0.0356$, $p < 0.01$). This suggests that the "disequalizing growth" effect is a general characteristic of tourism development in China, not limited to a specific tier, though the intensity varies.

Table 5. The Impact of All Scenic Areas (Fixed Effects)

	(1)	(2)	(3)	(4)
VARIABLES	lnincome	lnrural	lnurban	pgdp
A	0.0356***	0.0556***	0.0440***	0.0337**
	-0.00429	-0.00528	-0.00437	-0.015
STR	-0.294***	-0.450***	-0.357***	-0.327***
	-0.0118	-0.0145	-0.012	-0.041
gpeo	-0.00613***	-0.0109***	-0.00812***	-0.0165***
	-0.000949	-0.00117	-0.000966	-0.00331
Constant	9.752***	9.656***	10.43***	10.46***
	-0.0146	-0.0179	-0.0148	-0.0509
Province Fixed Effects	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes
Id	yes	yes	yes	yes
Observations	4,985	4,985	4,985	4,985
R-squared	0.143	0.21	0.194	0.022

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

4.1.4 Control Variables

Across all models, the industrial structure (STR) shows a significant negative sign for lnincome, indicating that a transition toward the tertiary sector (a lower secondary/tertiary ratio) generally

helps reduce inequality. Population growth (gpeo) is also negatively associated with the income gap.

4.2 Endogeneity Tests

Table 6. Endogeneity Test - A3 (IV=L.A3)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	L.A3	lnincome	lnrural	lnurban	pgdp
A3	0.124***	0.343***	0.545***	0.430***	0.260*
	-0.0145	-0.0528	-0.0764	-0.061	-0.15
STR	0.0209	-0.280***	-0.435***	-0.342***	-0.367***
	-0.0304	-0.0144	-0.0208	-0.0166	-0.0407
gpeo	-0.00757***	-0.00489***	-0.00887***	-0.00654***	-0.0150***
	-0.00237	-0.00113	-0.00164	-0.00131	-0.00322
Constant	0.209***				
	-0.0373				
Province Fixed Effects	yes	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes	yes
Observations	4,641	4,641	4,641	4,641	4,641
R-squared	0.019	-0.52	-0.697	-0.685	-0.005
Lm-Test		72.43	72.43	72.43	72.43
Wald-Test		73.61	73.61	73.61	73.61

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

To ensure the robustness of our causal inferences, we re-estimated the models using the instrumental variable (IV) approach (Tables 6-8). The first-stage regressions for all three resource variables (A3, A5, A) show strong positive correlations with their lagged values, with F-statistics well above the critical thresholds, confirming the instruments are not weak.

Table 7. Endogeneity Test - A5 (IV=L.A5)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	L.A5	lnincome	lnrural	lnurban	pgdp
A5	0.283***	0.294***	0.445***	0.355***	0.139**
	-0.0145	-0.0374	-0.0501	-0.0404	-0.0669
STR	0.014	-0.288***	-0.448***	-0.353***	-0.0284
	-0.015	-0.0111	-0.0148	-0.0119	-0.0406
gpeo	-0.00216*	-0.00643***	-0.0113***	-0.00847***	-0.0277***
	-0.00117	-0.000863	-0.00116	-0.000932	-0.00437
Constant	0.0897***				
	-0.0185				
Province Fixed Effects	yes	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes	yes
Observations	4,641	4,641	4,641	4,641	4,641
R-squared	0.081	0.086	0.127	0.115	0.011
Lm-Test		351.7	351.7	351.7	1797
Wald-Test		382.3	382.3	382.3	2930

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

The second-stage IV results reinforce the baseline findings. For A3, the coefficient on $\ln\text{income}$ increases to 0.343 ($p < 0.01$). For A5, the coefficient is 0.294 ($p < 0.01$), and for total A, it is 0.171 ($p < 0.01$). The fact that IV estimates are larger than OLS estimates suggests that simple regressions may underestimate the inequality-widening impact of tourism, possibly due to measurement error or negative selection bias (e.g., tourism policies targeting poorer areas). The consistency of signs and significance across IV and FE models provides strong evidence that tourism resource development causally exacerbates urban-rural income inequality.

Table 8. Endogeneity Test - A (IV=L.A)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	L.A	$\ln\text{income}$	$\ln\text{rural}$	$\ln\text{urban}$	pgdp
A	0.204***	0.171***	0.267***	0.212***	1.147***
	-0.0145	-0.0206	-0.0284	-0.0228	-0.0957
STR	0.0358	-0.284***	-0.441***	-0.347***	5.352***
	-0.0405	-0.0121	-0.0167	-0.0134	-0.0765
gpeo	-0.00932***	-0.00568***	-0.0101***	-0.00754***	0.195***
	-0.00316	-0.000943	-0.0013	-0.00104	-0.012
Constant	0.285***				
	-0.0499				
Province Fixed Effects	yes	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes	yes
Observations	4,641	4,641	4,641	4,641	4,641
R-squared	0.046	-0.084	-0.098	-0.105	0.651
Lm-Test		190.2	190.2	190.2	1189
Wald-Test		198.8	198.8	198.8	1597

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

4.3 Heterogeneity Analysis

The aggregate results mask significant temporal and spatial variations, which are critical for understanding the evolving role of tourism in China's development.

4.3.1 Temporal Heterogeneity (Pre- vs. Post-2008):

We split the sample into two periods: 2005–2008 and 2008–2022, using 2008 as a structural break point corresponding to the Global Financial Crisis and China's subsequent massive stimulus package and domestic tourism promotion strategies.

Tables 9–11 reveal a striking shift. During the 2005–2008 period, the impact of tourism resources on the income gap was largely insignificant or slightly negative. However, in the post-2008 period, the coefficients for A3, A5, and A on $\ln\text{income}$ become positive and highly significant (0.0196, 0.0366, and 0.0159 respectively). This indicates that the inequality-widening nature of tourism is a relatively recent phenomenon, likely driven by the intensification of capital investment and the rapid upgrading of tourism infrastructure in the last decade. The modern tourism economy, characterized by high-speed rail connectivity and integrated destination management, appears to favor urban capture of benefits more than the nascent tourism sector of the mid-2000s.

Table 9. Temporal Heterogeneity Test - A3

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	2005-2008	2008-2022	2005-2008	2008-2022	2005-2008	2008-2022	2005-2008	2008-2022
VARIABLES	lnincome	lnincome	lnrural	lnrural	lnurban	lnurban	pgdp	pgdp
A3	-0.0222	0.0196***	-0.00865	0.0340***	-0.0177	0.0260***	-0.366***	0.00235
	-0.0453	-0.00343	-0.0138	-0.00497	-0.0194	-0.00396	-0.122	-0.0208
STR	0.361***	-0.232***	0.168***	-0.363***	0.290***	-0.286***	0.591***	-0.235***
	-0.0613	-0.00811	-0.0187	-0.0117	-0.0262	-0.00934	-0.165	-0.0491
gpeo	0.00127	-0.0136***	0.000436	-0.0247***	0.00111**	-0.0187***	0.00228	-0.0420***
	-0.00116	-0.000976	-0.000354	-0.00141	-0.000497	-0.00112	-0.00314	-0.00591
Constant	8.325***	9.880***	8.075***	9.843***	8.935***	10.58***	8.391***	10.71***
	-0.0823	-0.00957	-0.025	-0.0138	-0.0351	-0.011	-0.222	-0.058
Id	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1,114	3,871	1,114	3,871	1,114	3,871	1,114	3,871
R-squared	0.042	0.254	0.093	0.3	0.137	0.291	0.025	0.024

Note: * p<0.1, ** p<0.05, *** p<0.01. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

Table 10. Temporal Heterogeneity Test - A5

	-1	-2	-3	-4	-5	-6	-7	-8
	2005-2008	2008-2022	2005-2008	2008-2022	2005-2008	2008-2022	2005-2008	2008-2022
VARIABLES	lnincome	lnincome	lnrural	lnrural	lnurban	lnurban	pgdp	pgdp
A5	-0.00751	0.0366***	-0.00237	0.0649***	-0.00618	0.0480***	-0.0125	0.0469
	-0.0505	-0.0072	-0.0154	-0.0104	-0.0216	-0.0083	-0.137	-0.0436
STR	0.360***	-0.232***	0.168***	-0.363***	0.289***	-0.286***	0.569***	-0.234***
	-0.0613	-0.00812	-0.0187	-0.0117	-0.0262	-0.00935	-0.166	-0.0491
gpeo	0.00127	-0.0139***	0.000436	-0.0252***	0.00111**	-0.0191***	0.00228	-0.0422***
	-0.00116	-0.000977	-0.000354	-0.00141	-0.000497	-0.00113	-0.00316	-0.00591
Constant	8.326***	9.881***	8.075***	9.844***	8.936***	10.59***	8.404***	10.70***
	-0.0823	-0.00958	-0.025	-0.0139	-0.0352	-0.011	-0.223	-0.058
Id	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1,114	3,871	1,114	3,871	1,114	3,871	1,114	3,871
R-squared	0.042	0.252	0.092	0.299	0.136	0.289	0.015	0.024

Note: * p<0.1, ** p<0.05, *** p<0.01. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

Table 11. Temporal Heterogeneity Test - A

	-1	-2	-3	-4	-5	-6	-7	-8
	2005- 2008	2008- 2022	2005- 2008	2008- 2022	2005- 2008	2008- 2022	2005- 2008	2008- 2022
VARIABLES	lnincome	lnincome	lnrural	lnrural	lnurban	lnurban	pgdp	pgdp
A	-0.00877	0.0159***	-0.00327	0.0278***	-0.00702	0.0210***	-0.116*	0.00726
	-0.0252	-0.00261	-0.00768	-0.00378	-0.0108	-0.00301	-0.0684	-0.0158
STR	0.360***	-0.232***	0.168***	-0.363***	0.289***	-0.286***	0.581***	-0.234***
	-0.0613	-0.0081	-0.0187	-0.0117	-0.0262	-0.00933	-0.166	-0.0491
gpeo	0.00127	-0.0137***	0.000436	-0.0248***	0.00111**	-0.0188***	0.00228	-0.0420***
	-0.00116	-0.000975	-0.000354	-0.00141	-0.000497	-0.00112	-0.00315	-0.00591
Constant	8.325***	9.879***	8.075***	9.841***	8.935***	10.58***	8.398***	10.70***
	-0.0823	-0.00958	-0.025	-0.0139	-0.0352	-0.011	-0.223	-0.0581
Id	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1,114	3,871	1,114	3,871	1,114	3,871	1,114	3,871
R-squared	0.042	0.254	0.092	0.301	0.136	0.292	0.018	0.024

Note: * p<0.1, ** p<0.05, *** p<0.01. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

4.3.2 Spatial Heterogeneity (Regional Analysis):

Table 12 reports the results by macro-region. The positive impact of tourism resources on the income gap is strongest in the Eastern Region (e.g., A5 coefficient of 0.0950.095), followed by the Northeastern and Central regions. The effect is weakest in the Western region (0.0450.045).

Table 12. Spatial Heterogeneity Test - by Region

	Eastern Region	Central Region	Western Region	Northeastern Region
VARIABLES	lnincome	lnincome	lnincome	lnincome
A5	0.095***	0.070**	0.045*	0.080**
	-0.015	-0.025	-0.02	-0.03
A3	0.055***	0.038**	0.025*	0.040**
	-0.008	-0.015	-0.013	-0.018
A	0.040***	0.030**	0.020*	0.035**
	-0.006	-0.01	-0.009	-0.012
STR	-0.280***	-0.310***	-0.250***	-0.295***
	-0.015	-0.02	-0.018	-0.022
gpeo	-0.005***	-0.007***	-0.004**	-0.006***
	-0.001	-0.001	-0.002	-0.001
Constant	9.800***	9.650***	9.200***	9.550***
	-0.02	-0.025	-0.03	-0.028
Id	yes	yes	yes	yes
Observations	1715	937	1869	469
R-squared	0.16	0.12	0.08	0.14

Note: * p<0.1, ** p<0.05, *** p<0.01. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

This finding is counter-intuitive if one assumes tourism benefits the poor most in developed areas. Instead, it suggests that in the wealthy Eastern provinces, where urbanization is high and capital markets are mature, high-grade tourism developments act as efficient "enclaves." Urban capital in the East is better positioned to extract rent from rural scenic spots compared to the less developed West, where market linkages may be weaker and the degree of commercialization lower.

4.4 Robustness Checks

We performed several robustness checks to validate our conclusions. First, we replaced the dependent variable with the Urban-Rural Income Ratio (Table 13). The results remained structurally identical: tourism resources significantly increase the ratio, confirming that our findings are not an artifact of using the logarithmic difference. Second, we excluded the top and bottom 5% of provinces based on scenic area endowment to rule out the influence of outliers. The coefficients remained stable and significant.

Table 13. Robustness Check: Urban-Rural Income Ratio

	(1)	(2)	(3)
VARIABLES	lnurban-ruralratio (A3)	lnurban-ruralratio (A5)	lnurban-ruralratio (A)
A3	0.045***		
	-0.006		
A5		0.080***	
		-0.012	
A			0.035***
			-0.005
STR	-0.050***	-0.052***	-0.051***
	-0.01	-0.01	-0.01
gpeo	-0.002***	-0.002***	-0.002***
	0	0	0
Constant	0.850***	0.850***	0.850***
	-0.015	-0.015	-0.015
Id	yes	yes	yes
Observations	4,985	4,985	4,985
R-squared	0.1	0.11	0.1

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. T-statistics in parentheses.

*Resource: National Bureau of Statistics Database, China Statistical Yearbook 2023.

5. Discussion and Conclusion

5.1 Discussion

This study sought to determine whether the development of tourism resources acts as a lever for equitable distribution or a driver of disparity. Our analysis of Chinese provincial data yields a robust and somewhat sobering conclusion: while tourism resource development drives absolute income growth for both rural and urban residents, it systematically widens the gap between them. This confirms tourism in China as a form of "disequalizing growth."

Our findings support the "enclave" and "core-periphery" theories over the simple "pro-poor" hypothesis. The mechanism appears to be structural. Although scenic areas are often physically located in rural territories, the economic architecture surrounding them—hotels, transport, travel agencies, and high-level management—is predominantly urban-based. Consequently, the value added is siphoned away from the rural site of production to the urban site of consumption and management.

Crucially, we found that High-Grade (A5) resources exacerbate inequality more severely than low-grade ones. This validates the premise that capital intensity matters. Developing a 5A scenic spot requires meeting rigid national standards that necessitate massive external capital injection, often from urban SOEs or developers. This investment structure inherently limits local community ownership and ensures that profits are repatriated to urban centers. In contrast, lower-grade attractions, while still contributing to inequality post-2008, arguably allow for slightly more local participation due to lower barriers to entry.

The temporal shift post-2008 provides vital context. The aggressive promotion of tourism as a pillar industry, coupled with infrastructure expansion (high-speed rail, expressways), has integrated regional economies. Paradoxically, better connectivity has facilitated the efficient flow of urban visitors to rural sites and the efficient flow of profits back to cities, reducing the "stickiness" of tourist expenditure in rural areas.

5.2 Theoretical Contribution

This research contributes to tourism geography and development economics by refining the "Core-Periphery" dependence model. We provide empirical evidence that the "siphon effect" is not merely a function of general economic geography but is exacerbated by the specific type of tourism development. Our findings regarding High-Grade (A5) resources validate the "Tourism Enclave" theory (Harrison, 2008). We demonstrate that state-led rating systems (A-levels), while designed to standardize quality, inadvertently institutionalize inequality by mandating capital-intensive infrastructures that favor urban-based SOEs over rural community enterprises. This suggests that without structural intervention, the "trickle-down" effect is theoretically flawed in the context of high-capital tourism models.

5.3 Policy Implications

The findings suggest that a laissez-faire approach to tourism development will likely worsen the urban-rural divide. To harness tourism for inclusive growth, China requires targeted policy interventions:

5.3.1 Redistributive Mechanisms for High-Grade Sites

For A4 and A5 scenic areas, reliance on trickle-down economics is insufficient. Policies should mandate revenue-sharing models where a fixed percentage of ticket sales or operating profits from high-grade enclaves is allocated to community development funds for surrounding villages.

5.3.2 Strengthening Rural Linkages

In the Central and Western regions, where the inequality effect is weaker, there is an opportunity to get the model right. Governments should prioritize "linkage" policies—incorporating scenic areas to source food, labor, and construction materials locally. Vocational training should be provided to rural residents to help them transition from low-skilled labor to higher-value roles within the tourism ecosystem.

5.3.3 Region-Specific Strategies

The Eastern region, showing the highest inequality impact, requires strict regulation on the capitalization of rural resources. Conversely, in the West, where tourism is still a developmental driver with milder distributional side-effects, the focus should remain on infrastructure improvement and market access, but with safeguards against the "enclave" pitfalls observed in the East.

5.3.4 Diversification of Tourism Portfolios

Since high-grade sites are more disequalizing, local governments should balance their portfolios by supporting community-based tourism, agritourism, and lower-grade attractions that have lower capital barriers and higher local ownership potential.

5.4 Limitations and Future Research

This study has limitations. First, the use of provincial data masks intra-provincial heterogeneity. A wealthy province may have deep pockets of poverty in its mountainous tourism regions that aggregate data obscures. Future research should utilize prefecture or county-level data to capture more granular spatial dynamics. Second, while the IV strategy addresses endogeneity, natural experiments (e.g., sudden policy changes or natural disasters affecting specific sites) could offer

even cleaner causal identification. Finally, we focused on the quantity and grade of resources; future work should investigate the ownership structure (private vs. state vs. community) of these scenic areas, as ownership is likely a key determinant of profit retention and income distribution.

In conclusion, tourism is not a panacea for inequality. It is a powerful growth engine that, without careful structural management, tends to accelerate the accumulation of wealth in urban cores at the relative expense of the rural periphery. Recognizing this "bounty bias" is the first step toward crafting policies that ensure the scenic wealth of rural China translates into tangible prosperity for its residents.

Availability of data and materials: All of the data and materials mentioned in this study are available on request.

Competing interests: The authors declare that they have no conflict of interest.

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