“The impact of tourism services development on income inequality in Kazakhstan’s regions”

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THE IMPACT OF TOURISM SERVICES DEVELOPMENT ON INCOME INEQUALITY IN KAZAKHSTAN'S REGIONS

Abstract

This study investigates the relationship between tourism development and income inequality across regions of the Republic of Kazakhstan, using regional panel data for 2003–2024. The empirical analysis is based on an unbalanced panel of 16 regions, comprising 367 region–year observations. Fixed-effects regression models are employed to examine how two distinct dimensions of tourism development (tourism services per capita and tourist accommodation places per capita) affect income inequality measured by the regional Gini coefficient.

The results indicate that the intensity of tourism service provision does not have a statistically significant effect on income inequality, even after controlling for cross-sectional dependence. In contrast, tourism accommodation infrastructure capacity is positively and statistically significantly associated with regional income inequality across all model specifications. Additional results show that income inequality is significantly influenced by poverty incidence, income polarization, healthcare expenditures, and the share of the rural population.

The coefficients on the per-capita tourist accommodation variable are positive across all specifications. This indicates that the growth of this indicator contributes to increased income inequality. Moreover, the coefficients for the indicators ShServPop and ShServPop(–1) are significant. However, they cannot be relied upon, as Pesaran's test rejects the hypothesis of cross-sectional independence for these specifications. This suggests that the growth of tourism infrastructure may exacerbate, rather than reduce, regional income differences due to capital concentration, skill-labor-oriented employment, and price effects.

The results highlight the need for complementary policies that promote inclusive tourism development and mitigate inequality-enhancing effects of tourism-related infrastructure investment.

Keywords income inequality, tourism development, regional development, emerging economies, pro-poor tourism

JEL Classification D31, R11

INTRODUCTION

Income inequality remains one of the most persistent and policy-relevant socioeconomic challenges in contemporary economies. Empirical evidence shows that high- and rising-income inequality can constrain long-term economic growth, weaken social cohesion, and increase political instability (OECD, 2015; Stiglitz, 2012). These challenges are particularly acute in emerging and transition economies, where labor markets, institutional frameworks, and redistributive mechanisms are still evolving (World Bank, 2016). In this context, identifying development strategies that can foster economic growth without exacerbating income disparities has become a central concern for both policymakers and researchers.

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Tourism is frequently promoted as one such strategy. Globally, tourism accounts for approximately 10% of world GDP and employment, making it one of the largest service sectors (World Tourism Organization, 2019). Owing to its labor-intensive nature and relatively low formal entry barriers, tourism is often expected to generate employment opportunities for low- and medium-skilled workers and contribute to poverty reduction (Ashley et al., 2007). As a result, international organizations and national governments have increasingly emphasized tourism-led development as a tool for stimulating regional growth, particularly in areas with limited industrial or agricultural opportunities.

However, despite these expectations, the distributional consequences of tourism development remain theoretically ambiguous and empirically contested. Empirical studies report mixed findings: some suggest that tourism expansion improves income distribution through employment creation and local economic linkages (Blake et al., 2008), while others find that tourism development is associated with rising inequality due to capital concentration, skill premia, and foreign ownership (Alam & Paramati, 2016). This divergence in results suggests that tourism is not inherently inclusive and that its impact on income inequality depends on the structure and form of tourism development.

A key limitation of the existing literature is the widespread reliance on aggregate tourism indicators, such as tourist arrivals or total tourism receipts, which obscure the heterogeneous nature of tourism activities (Pulido-Fernández & Cárdenas-García, 2021). Different components of tourism development may operate through distinct economic mechanisms and thus produce different distributional outcomes. In particular, service-based tourism activities may provide relatively accessible income opportunities for residents, whereas tourism accommodation infrastructure development is capital-intensive and may disproportionately benefit asset owners and investors (Britton, 1982; Mowforth & Munt, 2015). Failure to distinguish between these dimensions may contribute to inconsistent empirical findings.

Empirical evidence on the tourism–inequality relationship remains especially limited in transition and post-Soviet economies, where institutional quality, ownership structures, and regional development patterns differ markedly from those in mature tourism destinations. Kazakhstan represents a particularly relevant case. While tourism has been identified as a priority sector in national diversification strategies, income inequality remains substantial, with the national Gini coefficient fluctuating between 0.27 and 0.29 during the 2010s, alongside pronounced regional disparities in income levels, urbanization, and economic structures (Bureau of National Statistics of the Republic of Kazakhstan, n.d.). Moreover, tourism development in Kazakhstan is highly uneven across regions, ranging from infrastructure-intensive destinations to regions dominated by small-scale service provision.

Kazakhstan's pronounced regional heterogeneity and the availability of detailed regional statistics provide a suitable setting for analyzing the distributional effects of tourism at the subnational level. A regional panel approach allows control for unobserved, time-invariant characteristics. It offers a more precise assessment of how different forms of tourism development are associated with income inequality across diverse economic and social environments within a single country. Against this background, the study addresses the unresolved question of whether distinct forms of tourism development are associated with different income distribution outcomes at the regional level in a transition economy.

Despite the widespread promotion of tourism as a driver of inclusive economic growth, empirical assessments of its impact on socio-economic inequality remain contradictory. This ambiguity is particularly pronounced at the subnational level in transition economies. Accordingly, the study focuses on whether different forms of tourism development are associated with distinct effects on regional income inequality.

The analysis is grounded in two well-established theoretical perspectives. One strand of theory emphasizes that tourism development, through large-scale investment and asset ownership, may contribute

to income concentration and rising inequality. The second perspective highlights tourism's potential to promote more inclusive growth through employment creation and service-sector expansion. Building on these approaches, the study compares the two mechanisms within a unified econometric framework.

1. LITERATURE REVIEW AND HYPOTHESES

Tourism is widely promoted as a development strategy because it can generate jobs, stimulate local entrepreneurship, and finance infrastructure. However, its distributional outcomes remain theoretically ambiguous and empirically mixed: tourism can broaden income opportunities for low-skilled groups, but it can also concentrate gains among asset owners and skilled workers.

Income inequality has emerged as one of the most pressing socioeconomic challenges of the 21st century, affecting both developed and developing nations with profound implications for social cohesion, economic growth, and political stability (Piketty, 2014; Stiglitz, 2012; Atkinson, 2015). The widening gap between the rich and the poor has sparked intense academic and policy debates over the drivers of inequality and potential remedies. In the context of emerging and transition economies, tourism has frequently been promoted by international development organizations, national governments, and academic researchers as a promising tool for economic development, poverty reduction, and income redistribution, with the expectation that its benefits would trickle down to lower-income populations through employment creation, entrepreneurship opportunities, and infrastructure improvements (Blake et al., 2008; Ashley et al., 2007).

However, the relationship between tourism development and income distribution remains deeply contested in the academic literature, with empirical evidence suggesting complex, context-dependent, and sometimes contradictory outcomes across different geographic, institutional, and developmental contexts (Alam & Paramati, 2016; Nguyen et al., 2020; Chok et al., 2007). While some studies document tourism's poverty-reducing and inequality-diminishing effects through labor market channels and local economic linkages (Croes, 2014; Mahadevan & Suardi, 2019), others reveal inequality-increasing outcomes driven by unequal access to tourism benefits, foreign ownership patterns, and enclave development models that exclude local populations from value capture (Scheyvens, 2011; Chok et al., 2007).

A first strand of research links tourism to inequality through growth and labor-market channels. In standard development reasoning, tourism expands employment in accommodation, food services, transport, and related activities, often in regions where alternative formal jobs are limited (Sinclair, 1998). Because many tourism occupations do not require high credentials, the sector is frequently framed as relatively inclusive and capable of raising the incomes of vulnerable groups, including rural residents and women, mainly when local supply chains form and tourism spending circulates within the destination economy (Ashley, 2000; Blake et al., 2008; Jiang et al., 2025). This perspective underpins "pro-poor tourism" approaches that emphasize backward linkages (e.g., agriculture and crafts), small enterprise development, and local retention of tourism revenues as mechanisms that can compress income gaps and reduce poverty (Croes & Vanegas, 2008; Scheyvens & Russell, 2012; Tucker & Boonabaana, 2012; Bilan et al., 2025).

A second body of research highlights structural and political-economy mechanisms that can drive inequality during tourism expansion upward. Dependency and political economy perspectives emphasize leakage and unequal bargaining power: profits may be repatriated through foreign ownership or external management, while local communities capture a smaller share of value added (Britton, 1982; Mowforth & Munt, 2015; Scheyvens, 2011). Enclave development, particularly around large-scale resorts, may weaken linkages to local suppliers and reduce opportunities for broad-based participation, thereby reinforcing disparities between tourism-connected groups and the rest of the local economy (Chok et al., 2007). In such settings, tourism growth can coincide with higher measured inequality even when average incomes rise.

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A third mechanism concerns capital intensity and asset ownership, which is especially relevant when tourism development is driven by accommodation and real-estate investment. Building and operating hotels, resorts, and related facilities typically require substantial upfront capital and access to credit, so returns accrue disproportionately to those who already own land, possess capital, or have financial connections. The distributional effect can therefore resemble a "capital deepening" process in which tourism-related rents and profits concentrate among relatively affluent investors. At the same time, low-wage service employment expands more slowly or remains segmented (Lewis, 1954). This logic aligns with dual-economy interpretations, in which tourism creates a modern sector with higher productivity alongside a traditional sector, thereby raising within-region dispersion unless labor mobility and capability upgrading are strong (Scoones, 1998; Sen, 1999; Tao & Wall, 2009).

Relatedly, tourism may affect inequality via skill-biased employment and occupational segmentation. Although tourism is labor-intensive, wage structures within the sector can be steep: managerial and specialized positions (management, marketing, finance, and high-end culinary roles) tend to command substantial premia relative to housekeeping, maintenance, and basic service work. If migrants or non-local workers fill high-skill positions, or if training pipelines are weak, inequality can rise because the top of the tourism wage distribution expands faster than the bottom (Truong et al., 2020). Conversely, where vocational education and skills programs enable local upgrading into better jobs, tourism can be associated with more inclusive outcomes (Demena et al., 2021).

Another widely discussed channel is the effect of prices and cost of living, primarily through land and housing markets. Tourism demand can raise prices for goods and services in destination areas and may also increase land values and rents. Such inflation benefits property owners and tourism-facing firms. However, it can erode the real incomes of low-income households, particularly renters and workers outside the tourism sector, thereby widening effective inequality even if nominal wages increase (Gotham, 2005). These dynamics are often sharper when tourism concentrates geographically and when local institutions and regulations do not protect residents from displacement or speculative pressures.

Empirical research reflects these competing mechanisms and therefore reports heterogeneous findings. Some country studies find that tourism-related expansion is associated with poverty reduction and improved distribution, especially when tourism growth strengthens local linkages and creates employment for lower-income groups (Mahadevan & Suardi, 2019). In contrast, extensive cross-country panel studies often detect inequality-increasing average effects, particularly in weaker institutional environments, where elite capture, corruption, and unequal access to credit and land can shape who benefits from tourism growth (Alam & Paramati, 2016). Systematic reviews and meta-analyses similarly emphasize that tourism is not inherently pro-poor: outcomes depend on governance, openness/leakage, and the structure of the tourism product and ownership (Zhang, 2021).

A further theme in the empirical literature is that tourism–inequality relationships can be non-linear or conditional. Inequality may rise during early developmental phases when investment rents and skilled wage premia predominate, but later stabilize or decline as destinations mature, labor markets tighten, and entrepreneurship diffuses opportunities, an interpretation consistent with broader Kuznets-type reasoning (Kuznets, 1955; Lee & Chang, 2008). Tourism can also exacerbate regional inequality by concentrating growth in already advantaged areas while producing mixed effects within destinations, depending on migration, sectoral shifts, and local policy (Yang & Fik, 2014).

Despite the growth of this literature, several methodological issues remain important for credible inference. First, many studies rely on aggregate tourism measures (arrivals, receipts, GDP share) that combine distinct dimensions of tourism development, thereby obscuring the mechanisms underlying distributional outcomes. Conceptually, service intensity (flows) may be more accessible to small businesses and informal workers, whereas infrastructure capacity (stocks) is more capital-driven and may concentrate returns among owners. Second, cross-sectional dependence and common shocks can bias standard panel inference if not accounted

for. Third, endogeneity and reverse causality remain persistent concerns because inequality can influence tourism investment and destination competitiveness, and both may be responsive to unobserved regional characteristics.

These gaps are particularly salient for transition and post-Soviet contexts, where institutional change, ownership structures, and spatial development patterns differ from those in well-studied tourism regions. Kazakhstan is a relevant case because tourism has been promoted as part of diversification strategies, while regional heterogeneity in development levels, urbanization, and tourism concentration is pronounced (Hall, 2004; Sharpley & Telfer, 2015; OECD, 2017; Kantarci et al., 2014). Subnational analysis is therefore well-suited to clarify how different forms of tourism map onto inequality outcomes across heterogeneous regions.

Kazakhstan, a rapidly emerging Central Asian economy that has undergone substantial structural transformations since independence, constitutes a compelling and policy-relevant case for investigating this relationship. Following independence in 1991 from the Soviet Union, Kazakhstan has pursued ambitious economic diversification strategies to reduce dependence on natural resource extraction, with tourism explicitly identified as a priority sector for development in successive national development plans and strategies (Kantarci et al., 2014; OECD, 2017). The country's vast territory spans 2.7 million square kilometers and encompasses remarkable diversity in terms of regional economic development levels, tourism potential and resources, demographic composition, urbanization patterns, and socioeconomic characteristics. Major tourism-receiving regions such as Almaty and the capital, Astana, contrast sharply with remote rural regions that remain untouched by tourism development.

This pronounced regional heterogeneity within Kazakhstan, combined with the government's sustained push for tourism sector development and the availability of detailed regional panel data, creates an ideal natural experiment for examining how tourism development affects income distribution at the subnational level.

Theoretical science presents competing, often conflicting projections of the distributional consequences of tourism, arising from divergent premises about the dissemination of tourism-derived gains across local economies. On the one hand, the trickle-down perspective, rooted in neoclassical growth theory, posits that tourism is intrinsically labor-intensive, generating diverse employment opportunities for workers across a range of skill levels and educational backgrounds. In doing so, it has the potential to mitigate inequality by affording income-generating roles to lower-skilled workers who are otherwise vulnerable to unemployment or underemployment (Cannonier & Burke, 2019; Sinclair, 1998). This optimistic view emphasizes tourism's potential to create backward and forward linkages with other economic sectors, stimulating local production of goods and services, and generating multiplier effects that diffuse benefits broadly across the income distribution.

Furthermore, critical perspectives informed by dependency theory and political economy frameworks posit that tourism expansion in developing nations disproportionately advantages property owners, incumbent entrepreneurs, skilled laborers, and foreign investors positioned to dominate high-value segments of the tourism value chain, thereby aggravating rather than alleviating inequality (Alam & Paramati, 2016; Mowforth & Munt, 2015).

Despite the importance of understanding tourism's impact on distribution, empirical evidence on this issue in Central Asian contexts remains limited. This study addresses these critical gaps by, to our knowledge, providing the first comprehensive examination of the relationship between tourism development and income inequality across Kazakhstan's regions, using rigorous panel-data econometric methods applied to data spanning 2003–2023. We employ fixed-effects panel regression models that account for unobserved time-invariant regional heterogeneity, such as geographic characteristics, cultural factors, and institutional quality, which could confound cross-sectional analyses. Importantly, our analysis distinguishes between two conceptually and empirically distinct dimensions of tourism development: the per capita volume of tourism services, which reflects the intensity of tourism-related economic activities and service exchanges; and per capita accommodation capacity, which gauges the extent of tourism infrastructure investment and facility provision.

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This disaggregation is theoretically motivated by the recognition that different dimensions of tourism development operate through distinct economic channels and may therefore generate divergent distributional effects. Tourism service provision is generally more accessible to residents, small-scale entrepreneurs, and informal-sector workers through employment creation and participation in local supply chains, thereby broadening income opportunities and supporting more inclusive growth (Ashley et al., 2007; Croes, 2014). In contrast, the development of accommodation infrastructure is capital-intensive and closely linked to asset ownership and investment capacity, implying that the associated returns are more likely to accrue to higher-income groups and external investors, thereby reinforcing income concentration (Britton, 1982; Mowforth & Munt, 2015). Empirical evidence from developing and emerging economies further indicates that tourism expansion driven by large-scale investment may be associated with rising income inequality, consistent with capital capture and rent-distribution mechanisms (Alam & Paramati, 2016; Zhang, 2021). By distinguishing between tourism services and accommodation infrastructure, the analysis enables a more nuanced assessment of how specific forms of tourism development relate to income inequality and helps identify which tourism policy channels are more relevant from an equity perspective.

The purpose of this study is to empirically assess the impact of tourism development on income inequality across Kazakhstan's regions. Specifically, the study distinguishes between tourism service provision intensity and tourism accommodation infrastructure capacity to identify their potentially different distributional effects.

The hypotheses are as follows:

H1: The intensity of tourism service provision has a statistically significant effect on regional income inequality in Kazakhstan.

H2: Tourism accommodation infrastructure capacity has a statistically significant effect on regional income inequality in Kazakhstan.

H3: Tourism accommodation infrastructure development increases regional income inequality across regions of Kazakhstan.

2. METHODOLOGY

This study employs a quantitative panel-data approach to examine the relationship between tourism development and income inequality across regions of Kazakhstan. The methodological procedure consists of five sequential stages: data collection, variable construction, model specification, estimation strategy, and diagnostic testing.

The analysis is based on an unbalanced panel dataset covering Kazakhstan's regions over the period 2003–2024. Depending on data availability, the sample includes 16 regions (including cities with special status) and 367 region–year observations. All data were obtained from official statistical sources of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, including regional statistical yearbooks and specialized tourism statistics. Monetary variables were deflated using the national consumer price index with 2010 as the base year. The observation period was selected for the availability of consistent regional tourism statistics and to capture the pre-COVID-19 phase of tourism development (Mukhamediyev & Spankulova, 2020).

Income inequality is measured by the regional Gini coefficient calculated from decile income distributions. Tourism development is captured using two conceptually distinct indicators: (i) tourism service provision intensity, measured as tourism services per capita (in real terms), and (ii) tourism accommodation infrastructure capacity, measured as the number of accommodation places per capita. Control variables include consumer income per capita, the share of the population below the subsistence level, poverty depth, healthcare expenditures per capita, the share of the rural population, and the fund coefficient (top-to-bottom decile income ratio). These controls are included to account for income level effects, poverty characteristics, social spending, and demographic structure.

We employ two distinct measures that capture different dimensions of tourism development, motivated by the theoretical insight that various aspects of tourism may operate through distinct mechanisms. *ShServPop* measures the per-capita volume of tourism services provided in each re-

gion-year, expressed in thousands of Kazakhstani tenge, adjusted for inflation. This variable captures the intensity of tourism economic activity and the volume of transactions. It includes revenues from accommodation, food, transportation, guided tours, entertainment, and other tourism-related services, as reported by formally registered tourism businesses.

Second, *ShTourAccms* measures accommodation capacity per capita, calculated as the total number of accommodation places (in hotels, guesthouses, hostels, tourist camps, and other registered establishments) divided by the regional population. This variable captures the stock of tourism infrastructure investment and the region's capacity to host visitors. Unlike service provision, which fluctuates with actual visitor arrivals and spending, accommodation capacity is a more permanent infrastructure asset that reflects long-term investment decisions.

The distinction between these measures is conceptually important. Service provision may be more accessible to small-scale entrepreneurs, informal-sector workers, and households offering homestays or handicrafts, potentially creating more inclusive income opportunities. Accommodation infrastructure, in contrast, requires substantial capital investment and generates returns primarily to property owners and investors, potentially concentrating benefits among higher-income groups. Testing these dimensions separately helps determine which aspects of tourism development are most important for distributional outcomes.

We include several control variables identified in the inequality literature as important determinants of income distribution. *ConsIncPop* estimates consumer income per capita while controlling for overall income levels. *ShUnderSL* captures the share of the population with incomes below the official subsistence level (poverty line), representing the prevalence of extreme poverty. *Fund* measures the ratio of average incomes in the top decile to those in the bottom decile, providing an alternative inequality measure that focuses on the tails of the distribution.

PovDeep estimates poverty depth (poverty gap ratio), indicating how far below the poverty line the average poor person falls. This measure captures the severity of poverty beyond mere incidence. *ShHealthPop* represents healthcare expenditures per capita and proxies for social investment and public service provision that may affect inequality through redistribution. *ShRuralPop* measures the share of the rural population, controlling for urbanization patterns that strongly affect income distribution in developing countries (Ravallion, 2001; Spankulova et al., 2024). The descriptive statistics are given in Table 1.

Table 1. Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Gini	367	0.267	0.042	0.159	0.429
ShServPop	336	0.858	1.139	0.009	7.288
ShTourAccms	336	0.126	0.128	0.0033	0.8035
ConsIncPop	367	0.043	0.032	0.0018	0.209
ShUnderSL	367	0.0017	0.0027	0.00003	0.0188
ShHealthPop	208	38.90	28.06	4.950	180.45
Fund	367	5.466	1.392	2.836	11.110
PovDeep	362	3.160	4.870	0.1	24.0
ShRuralPop	322	48.93	16.28	15.36	87.01

The empirical analysis is based on fixed-effects panel regression models of the following general form:

$$Gini_{it} = \beta X_{it} + u_i + \lambda_t + \varepsilon_{it}, \quad (1)$$

where i indexes regions ($i = 1, ..., n$), t indexes time periods ($t = 1, 2, ..., T$), $Gini_{it}$ is the Gini coefficient for region i in period t, X_{it} is a vector of independent variables including tourism indicators and control variables, β is the vector of coefficients to be estimated, u_i represents unobserved time-invariant regional effects (fixed effects), λ_t represents unobserved time effects common to all regions, and ε_{it} is the idiosyncratic error term. Or model (1) in the extended version:

$$\begin{aligned} Gini_{it} &= \beta_0 + \beta_1 ShServPop_{it} \\ &+ \beta_2 ConsIncPop_{it} + \beta_3 ShUnderSL_{it} \\ &+ \beta_4 ShHealthPop_{it} + \beta_5 ShTourAccms_{it} \\ &+ \beta_6 Fund_{it} + \beta_7 PovDeep_{it} + \beta_8 ShRuralPop_{it} \\ &+ u_i + \lambda_t + \varepsilon_{it}, \end{aligned} \quad (2)$$

where $ShServPop_{it}$ is tourism services per capita, $ConsIncPop_{it}$ is consumer income per capita, $ShUnderSL_{it}$ is the proportion of the population with income below the subsistence level,

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$ShHealthPop_{it}$ is healthcare expenditures per capita, $ShTourAccms_{it}$ is tourist accommodation places per capita, $Fund_{it}$ – fund coefficient, $PovDeep_{it}$ is poverty depth, $ShRuralPop_{it}$ is the share of rural population in region *i* in period *t*. Check Table 2.

Table 2. Description of variables

Variable	Description
Gini	Gini index by 10 percent groups
ShServPop	Tourism services per capita (thousand tenge)
ShTourAccms	Tourist accommodation places per capita
ConsIncPop	Consumer income per capita
ShUnderSL	The proportion of the population with income below the subsistence level
ShHealthPop	Healthcare expenditures per capita
Fund	Fund coefficient (top/bottom decile ratio)
PovDeep	Poverty depth
ShRuralPop	Share of rural population (%)

The fixed-effects specification controls for all time-invariant regional characteristics, such as geographic features, cultural factors, historical development patterns, and institutional quality, that do not change over the observation period. This addresses potential omitted-variable bias due to unobserved regional heterogeneity. We estimated three models according to equation (2): pooled OLS (which ignores the panel structure), random effects, and fixed effects. The Breusch-Pagan test strongly rejected the null hypothesis that pooled OLS is appropriate ($p < 0.01$), indicating significant unobserved heterogeneity across regions. The Hausman test rejected the random effects specification in favor of fixed effects ($p < 0.01$), suggesting that unobserved regional characteristics are correlated with the independent variables.

We estimate five different specifications to test the robustness of results and examine different aspects of the tourism-inequality relationship. All specifications include region-fixed effects. We employ robust standard errors clustered at the regional level to account for potential heteroskedasticity and serial correlation within regions. The modified Wald test for groupwise heteroskedasticity was conducted for all specifications, confirming the presence of heteroskedasticity and justifying the use of robust standard errors.

For each specification, we conducted several diagnostic tests, including the modified Wald test for groupwise heteroskedasticity, the test for the significance of fixed effects, and Pesaran's test for cross-sectional dependence in residuals. The Pesaran test is critical because cross-sectional dependence violates the standard panel regression assumption that errors are independent across units. Such dependence can arise from standard shocks, spatial spillovers, or omitted variables affecting multiple regions simultaneously. Failure to account for cross-sectional dependence can lead to incorrect inference. Our analysis proceeds as follows: specification for which Pesaran's test does not reject the null of cross-sectional independence ($p > 0.10$) are considered reliable for inference.

The dataset used in this study was compiled from official regional statistics and has not been previously employed in published empirical research. We intend to make the compiled dataset publicly available through a recognized research data repository (e.g., Zenodo) upon manuscript acceptance.

3. RESULTS

The results are reported across multiple model specifications to assess robustness. All coefficient estimates are based on fixed-effects models with heteroskedasticity-robust standard errors clustered at the regional level. Model validity is evaluated using Pesaran's test for cross-sectional dependence, and only specifications that satisfy this diagnostic criterion are used for hypothesis testing.

Table 3 presents the fixed effects regression results for all five model specifications. All reported coefficient estimates are robust to heteroskedasticity. It also includes results from Pesaran's test for cross-sectional independence, which is crucial for assessing the reliability of each specification. The *R*-squared values for specifications passing diagnostic tests (1, 2, and 5) range from 0.884 to 0.896, indicating that the models explain approximately 88–90% of the within-region variation in the Gini coefficient. The impact of tourism services and other indicators on income inequality is illustrated in Table 3.

Of the estimated coefficients, the coefficient on the variable for the volume of tourism services provid-

Table 3. Impact of tourism services and other indicators on income inequality

Independent Variables	Specifications				
	(1)	(2)	(3)	(4)	(5)
ShTourAccms	0.0303** (0.0109)	0.0354** (0.0123)			0.0277** (0.0116)
ShServPop			−0.00095*** (0.0032)		
ShServPop (-1)				0.0060*** (0.0016)	
Fund	0.0250*** (0.0017)	0.0237*** (0.0019)		0.0257*** (0.0020)	0.0244*** (0.0018)
ConsIncPop			0.8461*** (0.2210)		
ShUnderSL		1.0748* (0.5282)	9.8167*** (1.3136)	4.2176*** (0.8340)	3.0779*** (0.7588)
ShHealthPop			−0.00051*** (0.00017)		
ShRuralPop	−0.00077*** (0.00020)	−0.00067*** (0.00016)		−0.00057*** (0.00012)	−0.00062*** (0.00010)
PovDeep				−0.0023*** (0.00047)	−0.0015** (0.0005)
Constant	0.1615*** (0.0128***)	0.1611*** (0.0110)	0.2429*** (0.0063)	0.1480*** (0.0109)	0.1566*** (0.0084)
Observations	293	293	208	274	288
Groups	14	14	16	14	14
R-squared	0.884	0.888	0.466	0.892	0.896
Pesaran's test	Not rejected	Not rejected	Rejected	Rejected	Not rejected

Note: Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

ed, *ShServPop*, in the third column of Table 3, is of interest. This coefficient is negative, indicating that increasing the per-capita volume of tourism services reduces income inequality in the region. Indeed, the more such services are provided, the more jobs are created in the tourism sector and the higher the income of those employed in it, who generally do not require a high level of education or special qualifications. This should likely reduce income inequality in the region.

The estimated coefficient for tourism accommodation infrastructure capacity is positive and statistically significant at the 5% level in all specifications that pass diagnostic testing. This result indicates a robust association between increases in per-capita accommodation capacity and higher regional income inequality.

The estimated coefficients for tourism service provision intensity are statistically significant only in model specifications that fail the cross-sectional dependence test. As a result, no statistically reliable effect of tourism service provision intensity on income inequality can be established based on the acceptable model specifications.

Regarding the control variables, the fund coefficient and the share of the population below the subsistence level are positively and statistically significantly associated with income inequality in the valid model specifications. In contrast, the share of the rural population and the depth of poverty are negatively associated with the Gini coefficient. Other control variables display mixed statistical significance across specifications. The *Fund* coefficient, like the Gini index, also reflects the degree of income inequality, but differs in that it only considers the extreme deciles. The relationship between them is positive. An increase in the share of the population with incomes below the poverty line (*ShUnderSL*) is associated with greater income inequality. The greater the number of low-income people, the higher the income inequality.

Two indicators have a decreasing effect on income inequality: the share of the rural population (*ShRuralPop*) and the poverty gap (*PovDeep*). A decrease in the rural population leads to an influx into cities, where they often lack well-paid jobs and adequate living conditions. This increases the share of the urban population with low incomes, which contributes to income inequality. On the

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one hand, if the average poor person falls even lower than the poverty line, the number of people with very low incomes increases, and, accordingly, income inequality increases. On the other hand, an increase in the poverty gap may result from raising the subsistence minimum and the poverty line. Although more people fall below the poverty line, the incomes of low-income groups have increased, which could generally reduce income inequality.

The coefficient on the health expenditure indicator (*ShHealthPop*) is negative, whereas the coefficient on the per capita consumer income variable (*ConsIncPop*) is positive. One could argue that an increase in the former reduces income inequality, whereas an increase in the latter increases it. However, in the third specification, Pesaran's test rejects the cross-sectional independence assumption, invalidating these conclusions.

Based on the statistically valid model specifications, the hypotheses are evaluated as follows. *H1* is not supported, as no statistically reliable effect of tourism service provision intensity on income inequality is identified. *H2* is supported, as tourism accommodation infrastructure capacity exhibits a statistically significant effect on income inequality. *H3* is supported, as the estimated effect of tourism accommodation infrastructure capacity on income inequality is positive.

4. DISCUSSION

The finding that tourist accommodation capacity increases income inequality, while initially counterintuitive given conventional development discourse portraying tourism as a tool for poverty reduction, can be understood through several interconnected mechanisms grounded in economic theory and empirical observation.

The most robust finding of this study is that the capacity of tourism accommodation infrastructure is positively associated with regional income inequality in Kazakhstan. This result aligns with strands of literature that emphasize capital concentration and asset ownership as key channels through which tourism can exacerbate inequality. Accommodation infrastructure requires substantial initial investment and access to finance, which in Kazakhstan is primarily concentrated among higher-income individuals, established business groups, and corporations. As a result, returns from tourism-related real estate and accommodation services are disproportionately captured by asset owners rather than distributed broadly through labor incomes. Similar inequality-enhancing effects of tourism investment have been documented in cross-country and regional studies, particularly in contexts characterized by uneven access to capital and weak redistributive mechanisms (Alam & Paramati, 2016; Zhang, 2021; Mukhamediyev & Spankulova, 2022).

The positive effect of accommodation capacity on inequality is also supported by evidence from studies highlighting tourism-driven real estate appreciation and rent extraction. As accommodation capacity expands, tourism demand intensifies pressure on land and housing markets, benefiting property owners while increasing living costs for non-owners. This mechanism has been observed in a range of tourism destinations, where tourism development contributes to gentrification and rising housing costs, thereby widening income and wealth gaps (Gotham, 2005). In Kazakhstan's major tourism regions, such dynamics are likely reinforced by the spatial concentration of tourism investment and limited regulatory instruments to counteract price effects.

In contrast, the absence of a statistically reliable effect of tourism service provision intensity on income inequality suggests that not all dimensions of tourism development have the same distributional consequences. Tourism services, such as food provision, transportation, guiding, and entertainment, typically involve lower entry barriers and may be more accessible to small entrepreneurs and informal workers. This distinction is consistent with arguments in the pro-poor tourism literature that emphasize service-based activities as potential channels for inclusive income generation (Ashley et al., 2007; Croes, 2014). However, the inability to empirically confirm this effect in the present study suggests that service-related benefits may be highly sensitive to standard shocks, regional spillovers, or unobserved factors, thereby complicating inference in panel settings.

The findings also reconcile conflicting results in earlier empirical articles by underscoring the importance of disaggregating tourism development into distinct components. Studies relying on aggregate indicators such as tourism receipts or arrivals may conflate service-based and capital-intensive elements of tourism, masking offsetting effects on inequality. By separating service provision from infrastructure capacity, this study demonstrates that tourism's inequality impacts depend critically on the dominant mode of tourism development. This insight is consistent with recent calls in the literature for more granular measurement of tourism activity when evaluating its socioeconomic effects (Pulido-Fernández & Cárdenas-García, 2021).

Compared with evidence from more mature tourism economies, Kazakhstan's results suggest that early-stage or investment-driven tourism development may be particularly prone to outcomes that exacerbate inequality. This pattern is consistent with non-linear interpretations of tourism–inequality relationships, in which inequality rises in the initial phases due to investment rents and skill premia. It may only decline later if employment deepens and linkages broaden (Lee & Kang, 2018). In a post-Soviet transition economy with evolving institutions and uneven regional development, such dynamics are likely amplified.

Overall, the paper indicates that tourism development in Kazakhstan has not automatically translated into more equitable income distribution. Instead, the structure of tourism expansion, particularly the emphasis on accommodation infrastructure, appears to play a decisive role in shaping distributional outcomes. These findings reinforce the view that tourism policy design, ownership structures, and complementary redistributive measures are central to determining whether tourism contributes to inclusive growth or rising inequality.

Several limitations should be acknowledged, as they point to important directions for future research. First, reliance on official regional-level aggregate statistics limits the granularity of analysis and prevents examination of mechanisms at finer scales. Income inequality could be examined at more disaggregated geographic levels: cities, districts, communities, or with more detailed microdata at individual or household levels to better understand specific mechanisms through which tourism affects different population groups. Individual- or household-level data would enable examination of who benefits directly from tourism development, how tourism employment affects household welfare, and whether tourism opportunities create pathways out of poverty for disadvantaged groups.

The relatively short time dimension of the panel (21 years) limits the ability to examine long-term dynamics, delayed effects, and potential nonlinearities in tourism-inequality relationships. Longer time series would enable more sophisticated dynamic panel models, examination of threshold effects, and assessment of whether tourism-inequality relationships change as destinations mature. The cross-sectional dependence issues encountered with service volume specifications suggest that the current specification does not fully capture important common factors or spillovers.

While we have discussed plausible mechanisms linking accommodation capacity to inequality, this study does not empirically test them. Examining inequality within tourism-dependent communities versus non-tourism areas at finer scales could reveal localized effects that are masked in regional aggregates. Value chain analysis, tracing how tourism revenues flow through local economies, could identify leakages, local retention rates, and multiplier effects that affect overall distributional outcomes. Alternative inequality measures beyond the Gini coefficient could provide additional insights. Future research should examine tourism's effects on poverty rates and poverty severity directly, income mobility, and whether tourism facilitates or hinders upward mobility, wealth inequality, and asset accumulation rather than just income flows, spatial inequality, including both inter-regional and intra-regional dimensions, and multidimensional inequality incorporating non-income dimensions such as health, education, and access to services.

Comparative studies across regions that investigate the moderating influences of institutional contexts, governance quality, policy frameworks, and initial conditions on the distributional im-

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pacts of tourism could identify generalizable patterns rather than context-specific variations. Comparing Kazakhstan's experience with other Central Asian countries, other post-Soviet states, or other emerging tourism destinations could provide valuable comparative insights. Longitudinal studies that track the same regions or communities over extended periods could better capture long-term dynamics and path-dependent processes. Complementary qualitative research (case studies, interviews with tourism workers and entrepreneurs, ethnographic fieldwork in tourism destinations) could provide a richer understanding of mechanisms and lived experiences that quantitative analysis alone cannot capture.

CONCLUSION

This study examined the relationship between tourism development and income inequality across Kazakhstan's regions, aiming to identify how different dimensions of tourism affect distributional outcomes in an emerging post-Soviet economy. By distinguishing between tourism service provision intensity and tourism accommodation infrastructure capacity, the analysis provided a more nuanced assessment of tourism-led development than aggregate tourism indicators do.

The empirical results demonstrate that the expansion of tourism accommodation infrastructure is associated with higher regional income inequality, whereas no statistically significant effect is found for tourism service provision intensity. These findings indicate that capital-intensive forms of tourism development tend to concentrate on economic benefits among asset owners and higher-income groups, thereby widening income disparities. In contrast, service-based tourism activities do not exhibit a clear or robust distributional effect at the regional level.

From a policy perspective, the results suggest that tourism development strategies should not assume automatic inclusiveness. Without complementary measures, infrastructure-focused tourism expansion may exacerbate inequality. Policies that promote local ownership, support small- and medium-sized tourism enterprises, invest in workforce skills, and use tourism-generated revenues for redistribution may help mitigate inequality-enhancing effects and improve the inclusiveness of tourism-led growth.

Several directions for future research follow from this study. Further work using micro-level household or firm data could clarify the mechanisms through which tourism affects income distribution and identify who benefits most from tourism expansion. Longer time series would allow examination of dynamic and non-linear effects as tourism destinations mature. Comparative studies across Central Asian or other transition economies would also help assess the generalizability of these findings and deepen understanding of tourism's role in shaping inequality in emerging contexts.

AUTHOR CONTRIBUTIONS

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