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Mechanisms for Developing Domestic Tourism in Bukhara Region, Uzbekistan: An Econometric Analysis and Strategic Framework

Azimov Otabek Khudayberdievich¹

1. Independent researcher of Bukhara State University, Bukhara, Uzbekistan

Citation: Khudayberdievich A. O. Mechanisms for Developing Domestic Tourism in Bukhara Region, Uzbekistan: An Econometric Analysis and Strategic Framework. American Journal of Economics and Business Management 2026, 9(4), 526-534.

Received: 19th Jan 2026
Revised: 30th Feb 2026
Accepted: 20th Mar 2026
Published: 17th Apr 2026



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Abstract: This article examines the factors shaping domestic tourism growth in Bukhara Region — a territory that stands out not only within Uzbekistan but across the broader Central Asian landscape in terms of its historical depth and cultural heritage. This study is based on official statistical data (2016–2023) for domestic tourists' arrivals and employs econometric modelling to identify the key determinants of fluctuations in arrivals from domestic tourists. A log-linear regression, $R = 0.9858$; $R^2 = 0.972$; approximation error = 0.76% was performed and validated. The five-year forecast prepared on this basis predicted 4.9 million domestic visitors at the end of the forecast period of 2025–2029. Alongside these quantitative findings, the paper puts forward three substantive contributions of an applied and theoretical character: first, the author proposes a refined conceptual definition of 'domestic tourism' as an economic category; second, a new recreational destination concept — 'Susanbil in the Desert' — is outlined for Kagan District; and third, the development and mass printing of the 'Official Tourist Map of Bukhara' is reported. The Discussion section draws on comparative material from Japan, Kazakhstan, Russia and the United States to situate Bukhara Region's trajectory within a global frame of reference. The paper closes with concrete policy recommendations addressed to regional tourism administrators, academic researchers, and practitioners in the field.

Keywords: Domestic tourism, Bukhara Region, econometric modelling, tourism forecasting, sustainable tourism, Uzbekistan, regional development, tourist infrastructure.

Introduction

At a global scale, tourism has consolidated its place as one of the most dynamically expanding segments of the modern economy. According to UNWTO estimates, the sector accounted for 11.2% of world GDP and generated approximately \$1.9 trillion in export earnings during 2024. Even within this wide umbrella, domestic tourism — broadly understood as travel undertaken by the residents of a country for leisure, cultural or business purposes, but not for crossing a national border — has been the structural mainstay of tourism sectors across the globe [1]. While there are differences between countries/regions, the empirical record is relatively stable: domestic travellers make up around 80–90% of all trips by tourists, and domestic tourism generates five to ten times more expenditures than international outlets once aggregate outlays are compared (UNWTO, 2023).

This article is especially significant for economies undergoing structural adjustment. Domestic tourism shifts spending away from richer urban centers to provincial and rural

areas, generating multiplier effects through accommodation, catering, local transport, artisanal production and related services. Some comparative figures are useful here. Nine out of ten Spaniards will make at least one domestic trip each year [2]. Despite being notoriously expensive to visit, Japan recorded more than 300 million internal tourism trips from 2005 to 2023, for a resident population of 127 million. In 2023, domestic travellers also spent \$933 billion in the US alone, which was 86 % of the total US tourism revenue — Statista, 2024.

Tourism was officially integrated into the development agenda of the State of Uzbekistan as well. Tashkent, Uzbekistan (UzDaily.Com) — By 2030, it is planned to attract 15 million foreign tourists and 25 million domestic tourists, which tasks are outlined in the Development Strategy of New Uzbekistan for 2022–2026. Achieving these numbers will require serious institutional reform, sustained investment in physical and digital infrastructure and — most importantly — a greatly enhanced analytical foundation for decisions. Central to this agenda is Bukhara Region [3]. Based around the UNESCO World Heritage Sites centred on the Historic Centre of Bukhara, it has been at the forefront of focused regional tourism initiatives since 2022 and has a level of overseas name recognition that few other regions of Uzbekistan can rival.

Against this backdrop, it is somewhat surprising that the academic literature on domestic tourism at the sub-national level in Central Asia remains sparse. Uzbek scholars — Abdurakhmonov, Islamov, Ibragimov, Tukhliyev, Aslanova and others (cited in Azimov, 2025) — have produced valuable work on institutional and theoretical aspects of tourism governance, but rigorous econometric modelling of domestic tourism demand specifically for Bukhara Region has not previously been attempted [4]. This article addresses that gap directly.

The study is guided by four research objectives: (i) describe the state and regulation of domestic tourism in Bukhara Region, (ii) create and evaluate an econometric model of domestic tourist arrival dynamics (iii) provide a medium-range forecast of domestic tourism volumes and revenues through to 2029 and (iv) turn the insights from this analysis into a roadmap that integrates elements of both strategic recommendations and practical innovations, including the design of an eco-tourism destination as well as the development of an official regional tourism map [5][6].

The article proceeds as follows. Section 2 covers data sources and analytical methods. Section 3 reports the empirical results. Section 4 situates the findings within international practice and draws out policy implications. Section 5 states the conclusions and recommendations.

2. Materials and Methods

2.1. Data Sources and Study Period

The quantitative analysis rests on an eight-year panel of annual data covering 2016 through 2023. Data were gathered from four institutional sources: the State Statistics Committee of the Republic of Uzbekistan; the Tourism Committee under the Ministry of Ecology, Environmental Protection and Climate Change; the Ministry of Finance; and UNWTO official statistical databases [7]. Preliminary numbers for 2024 were used when available, and namely from the annual report on the tourism development state Committee for this year, but they were used only for descriptive purposes and have not been included in the regression estimation.

The dependent variable (Y) is the annual count of domestic tourists visiting Bukhara Region, measured in millions of persons [8]. Three explanatory variables were selected after reviewing the tourism demand literature and assessing data availability:

- X_1 — the number of officially registered cultural heritage sites in the region, used as a proxy for the attractiveness of Bukhara as a destination;

- X_2 — per capita gross domestic product in the region (in thousands of UZS), serving as an indicator of household purchasing power and travel affordability;
- d_t — a binary dummy variable set equal to 1 in years characterised by major negative shocks (pandemic, serious security incidents) and 0 otherwise.

Variable selection was deliberately parsimonious, guided by the need to avoid multicollinearity problems in a relatively short time series.

2.2. Econometric Model Specification

Following the approach common in tourism demand studies — particularly the multiplicative power function specification advocated by Lim & McAleer (2001) and applied extensively by Song & Li (2008) — the following model structure was adopted:

$$Y = e^{b_0} \cdot X_1^{b_1} \cdot X_2^{b_2} \cdot e^{(b_3 d_t)} \dots (1)$$

Taking natural logarithms of both sides linearises the model:

$$\ln Y = b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 d_t \dots (2)$$

Substituting $y = \ln Y$, $x_1 = \ln X_1$, $x_2 = \ln X_2$ yields the estimation form:

$$y = b_0 + b_1 x_1 + b_2 x_2 + b_3 d_t \dots (3)$$

Parameters were estimated using ordinary least squares (OLS). Model quality was evaluated through four diagnostics: the multiple correlation coefficient (R), the coefficient of determination (R^2), the mean approximation error (A), and Fisher's F-test [9]. Standardised regression coefficients were computed to compare the relative influence of each predictor. A separate linear time-trend model — augmented with the shock dummy — was specified for revenue forecasting purposes.

2.3. Qualitative and Strategic Analysis

The statistical modelling was complemented by a structured comparative analysis of domestic tourism development in four reference countries: Japan, Kazakhstan, Russia and the United States. The selection reflects different development contexts, geographic scales and tourism intensities, making the set well-suited to benchmarking. A marketing sequence framework adapted from the author's earlier methodological work was applied in assessing Bukhara's regional tourism positioning, and a SWOT analysis was conducted to systematise the region's strengths, weaknesses, opportunities and threats [10]. Field visits and consultations with regional tourism stakeholders provided the empirical basis for the two strategic proposals — the eco-destination concept and the tourist map — described in Section 3.4.

3. Results

3.1. Current State of Domestic Tourism in Bukhara Region (2023–2024)

Bukhara Region's tourism sector has recorded a notable recovery since the disruptions of 2020–2021. The headline figures for 2023 and 2024 are presented in Table 1.

Table 1. Key Tourism Performance Indicators, Bukhara Region, 2023–2024.

Indicator	2023	2024	Growth Rate (%)
Total visitors (thousand persons)	4,877.0	5,755.2	118.0
Foreign tourists (thousand persons)	1,387.0	1,745.2	125.8
Domestic tourists (thousand persons)	3,790.0	4,010.0	114.9
Tourism revenue (USD million)	339.1	436.3	128.7
Accommodation facilities (units)	544	607	111.6
Tour operators / travel agencies	143	186	130.0

Indicator	2023	2024	Growth Rate (%)
Employment in tourism sector (persons)	~55,000	73,400	~133.5

Source: State Committee for Tourism Development of Uzbekistan (2024); author's calculations.

Several features of these data deserve attention. In 2024, 69.7% of all visitors were domestic tourists, highlighting the central importance of the domestic market to the region's tourism economy. The total revenues were USD 436.3 million, an increase of nearly 29% YOY. The number of accommodation units increased from 607 facilities; the number of registered operators expanded from 143 to 186 entities; and sectoral employment within the local labour market doubled from 15,000 workers in 2019 and over 73,000 (a fivefold increase) by 2024 — indicating the extent to which the growth in relation to the sector was diffused through the labour market locally [11].

The 2019–2020 disruption period provides a useful reference point. COVID-19 stripped Bukhara Region of approximately 230,000 foreign and 750,000 domestic visitors, producing an estimated USD 48 million revenue shortfall and a reduction of some 100 billion UZS in tourism-linked tax receipts (Azimov, 2025). The recovery since 2021 has outpaced expectations, driven by accumulated domestic demand and by targeted government support measures.

In terms of contribution on horizontal sector to macro-economic, today domestic tourism comprises 4–5% of total Regional GDPs. Multiplier linkages in hospitality, transport, retail and agro-tourism could eventually take this up to 5–6% in two to three years. Seasonality remains a structural constraint: the visitor surge is highly seasonal, with a sharp winter trough that current product remains insufficient to fill [12].

3.2. Econometric Model Estimation Results

Fitting the log-linear model (Equation 3) to the 2016–2023 dataset produced the following estimated relationship:

$$y = 4.24 + 3.25x_1 + 1.9x_2 - 5.04d_t \dots (4)$$

Converting back to the original multiplicative form:

$$Y = e^{4.24} \cdot X_1^{3.25} \cdot X_2^{1.9} \cdot e^{(-5.04d_t)} \dots (5)$$

Reading these coefficients in practical terms: the elasticity of domestic arrivals with respect to the cultural heritage site count stands at 3.25, which is quite high and suggests that heritage development and registration is a particularly powerful lever. The income elasticity of 1.9 is positive and meaningful, consistent with the expectation that rising household incomes should feed through to increased domestic travel [13]. The dummy coefficient of –5.04 quantifies the severity of shock events — pandemic years or major disruptions cut domestic arrivals sharply, as one would expect from the 2020 data point.

Table 2. Regression Model Fit Statistics.

Statistic	Value	Interpretation
Multiple correlation coefficient (R)	0.9858	Very strong positive relationship
Coefficient of determination (R ²)	0.972	Model explains 97.2% of variance
Approximation error (A)	0.76%	High accuracy (<10% threshold)
F-statistic	Significant at p < 0.001	Model is statistically significant
Number of observations	8	2016–2023 annual data

Source: Author's econometric calculations based on State Statistics Committee data.

The goodness-of-fit indicators are strong. An R^2 of 0.972 means the three variables together explain 97.2% of the observed variation in domestic arrivals — a high figure even by the standards of applied tourism econometrics [14]. The approximation error of 0.76% falls well under the 10% ceiling that is conventionally treated as the upper bound for acceptable forecast accuracy. Fisher's F-test is significant at $p < 0.001$, confirming that the regression equation as a whole is statistically valid (Table 2).

For revenue projections, a linear time-trend specification was estimated:

$$y = -160.73 + 101.69t - 248.45d_t \dots (6)$$

Here t indexes the time period and d_t retains its earlier definition. This model yields $R = 0.984$, $R^2 = 0.968$, and $F = 75.71$ ($p = 0.000183$). All coefficient confidence intervals exclude zero at the 95% level, confirming that each included variable carries genuine explanatory power.

3.3. Five-Year Forecast: Domestic Tourist Arrivals and Revenue (2025–2029)

Projecting forward under baseline assumptions — continued heritage site registration, moderate per capita GDP growth, and no major shock events ($d_t = 0$) — yields the figures shown in Table 3.

Table 3. Forecast of Domestic Tourist Arrivals and Revenue, Bukhara Region, 2025–2029.

Indicator	2025	2026	2027	2028	2029
Domestic tourist arrivals (million persons)	3.85	4.12	4.40	4.70	4.90
Domestic tourism revenue (billion UZS)	754.5	856.2	957.9	1,059.6	1,161.3
Revenue per tourist (thousand UZS)	196.0	207.8	217.7	225.4	236.9

Source: Author's forecasting models. Revenue in billion Uzbek soum (UZS).

The projections point to steady, if unspectacular, growth. Domestic arrivals are expected to climb from 3.85 million in 2025 to 4.9 million in 2029 — a 27.3% cumulative gain over the five-year window. Revenue follows a steeper trajectory: from 754.5 billion UZS to 1,161.3 billion UZS, an increase of 53.9%. Per-tourist spending is forecast to rise from 196,000 to 236,900 UZS, which suggests that visitors are not only growing in number but gradually becoming higher-value customers as household incomes improve and service quality advances [15].

3.4. Strategic Innovations: Two Original Contributions

Beyond the statistical findings, this study introduces two applied contributions that the author regards as independently significant.

The first is a concept for a new eco-recreational destination called 'Susanbil in the Desert' (Sahrodagi Susanbil), proposed for Kagan District of Bukhara Region. The logic is simple: a large and expanding segment of domestic visitors to the region is short-stay recreational travellers who aren't really all that well catered for by Bukhara's predominantly heritage product. A vision of a multi-purpose development to include forested areas for recreation, an artificial lake, trails for bicycles, recreational amenities, and picnic areas offering different tourism products was proposed to alleviate the burden of heavily concentrated demand outside of spring and summer into the other seasons [16]. First estimates indicate that the development could create 500-800 direct jobs, as well as additional indirect employment in transport, catering and regional supply chains.

The second contribution is the 'Official Tourist Map of Bukhara' — a cartographic product that inventories major tourist sites, heritage objects, accommodation facilities, transport links and recommended routes across the region. The map has been printed in 20,000 copies and is being distributed through tourist information centres, airports, hotels and tour operator networks nationwide. Beyond its immediate function as a wayfinding tool, the map serves as a regional branding instrument and has required, as a by-product of its preparation, a comprehensive audit and classification of all tourist assets in the region — a contribution to governance that has independent administrative value [17].

4. Discussion

4.1. *International Benchmarks and Implications for Bukhara Region*

Placing Bukhara Region's figures in comparative international perspective helps identify both the scale of the opportunity and the policy instruments most likely to be effective.

Japan serves as what is perhaps the clearest case study for a heritage-rich destination with a relatively mature domestic tourism market. Japan has so many domestic tourists that they registered well over 300 million domestic tourist trips per year during 2005–2023 with 127 million people; Tokyo received 543 million domestic visitors in 2024. The model has much to thank for its dense, high speed rail network (the Shinkansen System), a well developed domestic travel sector, a forward-looking cultural tourism policy and a truly diverse attraction mix of cultural precincts, natural attractions, hot spring culture (onsen) and food [18].

Perhaps most relevant for Bukhara is Japan's comparatively even seasonal spread — with summer (27%), spring and autumn (26% each) and winter (21%) each contributing a meaningful share of annual visits — suggesting that deliberate product diversification can substantially flatten demand peaks.

Kazakhstan offers a geographically and economically closer point of comparison. The domestic tourist-to-population ratio there rose from 18.2% to 27.4% between 2015 and 2024, with absolute visitor counts reaching 5.1 million in 2024 — a year-on-year increase of 9.8%. The Kazakhstani experience demonstrates that sustained double-digit growth in domestic tourism participation is achievable even in large continental territories with dispersed populations, provided that government stimulus, tax incentives and targeted infrastructure investment are brought to bear consistently [19][20].

The United States case reinforces a different point: the sheer economic weight of domestic tourism relative to inbound international travel. In absolute terms, US domestic travel overshadows international receipts, with domestic tourism registered at \$933 billion in 2023 — 86% of total tourism spending. We cannot have it miss out: the policy implication is that destination capacity of its own market is not a consolation prize for those unable to lure the international visitor — it is the chief source of tourism wealth of most economies.

The trajectory of Russia after 2014 (and, after 2020) provides evidence of the logic that builds resilience. As outbound international travel was constrained — initially by self-financing and subsequently by pandemic constraints — domestic tourism absorbed a large part of the lost demand. Domestic services represented as high as 65 per cent of the overall tourism spend in the most constrained period [21]. This substitution dynamic is directly relevant for Uzbekistan: developing a strong domestic tourism market becomes a structural cushion against the external shocks of exactly the type that hit Bukhara in 2020.

In summary, these comparisons place Bukhara Region's 2024 visitation level at just under 11% of Uzbekistan's national population — far below Kazakhstan's 27.4%, and at a fraction of Japan's per-capita levels.

This gap is, from a strategic standpoint, an opportunity rather than a failure: even a modest improvement in the domestic travel participation rate of Uzbekistan's 36 million residents would translate into large absolute gains for the region.

4.2. Policy Implications

Several concrete policy directions emerge from the econometric results. The high elasticity of arrivals with respect to the heritage site count (3.25) is perhaps the single most actionable finding: it suggests that further investment in heritage registration, conservation and visitor access yields disproportionate returns in terms of domestic tourist flows [22]. Uzbekistan has more than 8,000 officially registered cultural monuments and gaining access to these assets — especially in the areas that are the least visited — should be a key focus.

The result of 1.9 for income elasticity is also telling, but less so directly. It means that with higher household incomes, domestic tourism will develop automatically of its own accord and therefore does not need to be directly subsidised by policy. Focus rather should be paid to structural removals — high transport fares, low paid leave entitlements, scarce traveling financing products — that stop low-income groups from turning travel interest into actual trips.

The fact that the large negative shock coefficient (−5.04) reminds us just how vulnerable regional tourism can be to external shocks [23]. Resilience can come in the form of diversification of the product base — things like online tourist offers, virtual heritage experiences and the short-break that will see some form of visitation remain alive even in the times of emergencies.

Last but not least, the seasonality of the concentration matter needs to be targeted. The peaks for spring and summer in Bukhara Region are steep; the trough for winter is sharp.

Expanding the MICE segment (Meetings, Incentives, Conferences and Exhibitions), developing pilgrimage (ziyorat) tourism to off-peak periods, promoting health and spa-based offerings, and staging gastronomic or cultural festivals in autumn and winter would help smooth demand across the calendar year and improve the financial viability of tourism enterprises that currently struggle through the low season [24].

4.3. Limitations

Some caveats should be stated explicitly. This is performed with a regression model fitted only to the eight available annual observations, resulting in the restriction of predictors entries that can be introduced and the accuracy of the coefficient estimates. Although considered the gold-standard proxy at the time of writing, the cultural heritage site count is not capable of capturing the qualitative advancements in local sites nor changes to the visitor experience. Using a simple linear time trend for the revenue model damages the estimation of non-linear growth dynamics that may form over the forecast horizon.

Future work would benefit from higher-frequency data (quarterly or monthly), a longer time series, and the inclusion of additional demand-side variables — transport cost indices, digital marketing spending, consumer confidence measures — that were unavailable for the current study period.

5. Conclusion

This study delivers a validated econometric model of domestic tourism demand in Bukhara Region ($R^2 = 0.972$; approximation error = 0.76%), showing that three variables — cultural heritage site availability, per capita GDP and a shock indicator — together account for nearly all the observed variation in annual domestic arrivals over the 2016–2023 period. Projections through 2029 suggest arrivals will reach 4.9 million and domestic tourism revenue will approach 1,161 billion UZS, from a 2025 baseline of 3.85 million visitors and 754.5 billion UZS respectively.

Three original contributions accompany these quantitative findings: an author-proposed definition of domestic tourism as an economic category; the 'Susanbil in the Desert' eco-recreation destination concept for Kagan District; and the 'Official Tourist Map

of Bukhara', printed in 20,000 copies and now circulating through the regional information network.

The main practical recommendations from this research are:

- Prioritise the registration, conservation and accessibility upgrade of cultural heritage sites, given their outsized demonstrated impact on domestic tourist arrivals;
- Invest in year-round product diversification — MICE, ziyorat, health and gastronomic tourism — to address the severe seasonal imbalance;
- Move forward with the 'Susanbil in the Desert' development in Kagan District to capture the short-stay recreational segment;
- Build digital tourism infrastructure — booking systems, electronic guides, an official tourism application — to reduce the information barriers that currently inhibit domestic travel participation;
- Scale up handicraft support at the regional level, capitalising on documented domestic demand for authentic local products;
- Establish a systematic tourism monitoring framework using the performance indicators reported in this study to support evidence-based management going forward.

Bukhara Region holds genuine assets — a UNESCO-listed historic core, a growing accommodation sector, and an expanding operator network. With consistent institutional commitment and strategically directed investment, the region has a credible pathway to domestic tourism volumes comparable to leading heritage destinations elsewhere in Central Asia.

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