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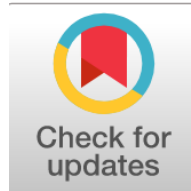
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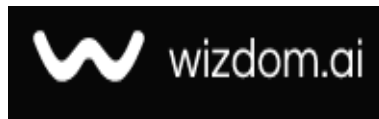
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Determinants of Hotel Performance in Uzbekistan's Transitioning Economy

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Abstract

General Background: The hospitality sector plays a critical role in supporting economic development, particularly in emerging tourism destinations. **Specific Background:** Uzbekistan, undergoing structural and economic transformations, presents a unique case for evaluating the determinants of hotel performance in a transitioning economy. **Knowledge Gap:** Despite growing interest in tourism-driven growth, empirical analyses on how macroeconomic and infrastructural factors influence hotel performance in post-Soviet states remain limited. **Aims:** This study investigates the impact of foreign direct investment, international tourist arrivals, ICT infrastructure, skilled labour availability, and government support on hotel performance across Uzbekistan's 14 regions from 2015 to 2023. **Results:** Employing a balanced panel dataset, the analysis reveals that all key variables positively and significantly affect revenue per available room (RevPAR) and occupancy rate, with digital infrastructure and human capital exerting the strongest influence. **Novelty:** The study provides a regionally disaggregated, data-driven assessment of hotel performance drivers in a post-transition economy, bridging the gap between institutional development and tourism sector outcomes. **Implications:** The findings underscore the need for integrated policy frameworks that align technological advancement with human capital and institutional support to enhance competitiveness in the hospitality industry across similar transitional contexts.

Highlight:

- Digital infrastructure and human capital are the strongest drivers of hotel success.
- First empirical study using regional panel data in post-transition Uzbekistan.
- Highlights need for synchronized policy and institutional support in tourism.

Keywords: Hotel Performance, Uzbekistan, ICT Infrastructure, Skilled Labour, Tourism Development

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Introduction

The worldwide hospitality business is crucial for tourism-related economic development, particularly in emerging and transitioning nations, where it substantially contributes to GDP growth, employment, and foreign exchange profits. In the last twenty years, the growth of tourism has generated new prospects for nations to diversify their economies and enhance regional infrastructure. The performance of hotels has emerged as a crucial factor in a destination's competitiveness, directly affecting visitor happiness, repeat visits, and destination branding. Nonetheless, comprehending the factors influencing hotel performance presents a complex task, especially in areas experiencing economic liberalisation and structural development. Uzbekistan provides a distinctive setting to examine these processes. Since 2016, the government has enacted extensive changes to liberalise its economy, attract foreign investment, and establish the nation as a cultural and eco-tourism centre in Central Asia. These modifications have precipitated an increase in visitor arrivals and fostered expansion in hospitality infrastructure. Nonetheless, performance within the hotel business is inconsistent, exhibiting significant variations in service quality, operational efficiency, and digital integration across different locations. Current literature regarding hotel performance in developed economies frequently highlights market maturity, firm size, and global branding [1], [2], [3]; however, these elements may inadequately account for discrepancies in emerging or post-Soviet economies such as Uzbekistan, where public policy, institutional support, and technological advancement are also significant factors. This study seeks to empirically evaluate the determinants of hotel performance in Uzbekistan, utilising a panel dataset covering 14 regions from 2015 to 2023. Utilising resource-based theory and regional development models, we analyse the impact of variables like foreign direct investment, tourist demand, ICT infrastructure, human capital, and government support on key performance indicators—specifically, revenue per available room (RevPAR) and occupancy rates. The study provides a thorough assessment of hotel sector performance by integrating macroeconomic controls and micro-level company characteristics within a changing national framework. This study enhances the global literature in three notable aspects. This study offers one of the initial panel data evaluations of hotel performance in Central Asia, a region that is under-represented in tourist research. Secondly, it emphasises the essential importance of digital preparedness and institutional structures in improving hotel performance—elements frequently neglected in traditional hospitality paradigms. Third, the results provide pragmatic recommendations for policymakers seeking to foster sustainable, innovation-driven growth in Uzbekistan's tourist industry. This study addresses global demands for context-sensitive, data-driven methodologies in tourist development inside emerging markets.

Literature Review

The performance of the hotel business has consistently been a focal point in hospitality research, especially as governments emphasise tourism for economic diversification and regional development. Hotel sector performance is typically assessed by metrics such as Revenue per Available Room (RevPAR), Average Daily Rate (ADR), Occupancy Rate (OR), and Gross Operating Profit per Available Room (GOPPAR). These measures offer an extensive perspective on a hotel's operational and financial efficacy and have become standard in both academic and managerial assessments [4]. Empirical research repeatedly demonstrates that hotel success is influenced by a mix of organisational traits, managerial efficacy, technological integration, locational factors, and macroeconomic situations. At the organisational level, cost management, asset efficiency, and labour productivity are essential determinants of profitability [5]. The hotel's size, classification, and ownership status—whether independent or part of an international chain—are major factors; chain-affiliated and larger establishments frequently gain advantages from economies of scale, enhanced branding, and broader distribution channels. The quality of management, encompassing leadership style, employee training initiatives, and human resource procedures, has been shown to strongly influence hotel key performance indicators (KPIs). Hotels that prioritise skill development and equip their workers with contemporary management techniques typically achieve greater customer satisfaction, therefore enhancing revenue performance and occupancy rates [6], [7]. In transition economies such as Uzbekistan, deficiencies in managerial capabilities and disjointed service delivery methods continue to pose significant barriers to competitiveness. The adoption of technology is increasingly regarded as a transforming element in hotel performance. The implementation of property management systems (PMS), customer relationship management (CRM), dynamic pricing algorithms, and online booking integration has been associated with enhanced guest satisfaction, operational efficiency, and market visibility [8]. Hotels that utilise digital tools and collaborate with global online travel agencies (OTAs) can more effectively adapt to demand variations, customise services, and sustain revenue stability, especially during turbulent times such as the COVID-19 pandemic [9], [10]. Factors related to location and destination can affect hotel outcomes. Properties in urban centres, tourist attractions, or proximity to transit hubs generally exhibit superior performance owing to increased foot traffic and enhanced accessibility. The appeal of the surrounding location, the quality of infrastructure, and the branding of the locality are all favourably connected with hotel success [11]. Supplementary factors such as seasonality, market saturation, and event tourism further distinguish performance trends [12]. Macroeconomic stability and the regulatory framework are crucial for maintaining hotel performance, especially in emerging settings. Fluctuations in exchange rates, inflation, and intricate licensing frameworks might hinder investment and restrict profitability [13]. In contrast, governmental support methods, including tax incentives, infrastructure development, and finance for small and medium enterprises, have been shown to enhance hotel expansion and modernisation [14]. In numerous nations, including Uzbekistan, the government significantly influences the hospitality sector's results via public-private partnerships, talent enhancement initiatives, and investments in tourism infrastructure [15]. The hotel business in Uzbekistan has experienced remarkable growth following the implementation of extensive tourism

reforms in 2016. The measures encompassed visa liberalisation, less bureaucratic obstacles, and focused assistance for hospitality businesses. Research demonstrates that despite the growth in hotel supply and visitor arrivals, inconsistencies persist in service quality, geographical accessibility, and the adoption of innovation [16]. Khudoykulov and Tadjibayeva's investigation utilising Data Envelopment investigation (DEA) revealed that hotels in Samarkand and Bukhara exhibit superior performance compared to those in outlying locations, attributed to enhanced tourist infrastructure and governmental prioritisation [17]. Other national studies highlight that service quality, technical preparedness, and the availability of trained labour are important to hotel performance. Hotels that invest in digital platforms, prioritise staff development, and implement international standards typically see elevated occupancy rates and improved financial performance . Nonetheless, numerous local properties, particularly small and medium-sized enterprises, continue to encounter obstacles in implementing such methods owing to restricted access to cash and human resources. The COVID-19 outbreak severely affected Uzbekistan's hotel industry. Occupancy rates significantly decreased, and operational revenues diminished, particularly in independent and non-chain hotels. However, properties that diversified their clientele, implemented adaptable pricing strategies, and incorporated digital reservation systems exhibited more resilience. This reflects global studies that highlight the protective function of adaptability, digital infrastructure, and institutional support during crises [18],[19]. Notwithstanding these contributions, the empirical research concerning Uzbekistan's hotel sector remains insufficiently developed. Most current research is either descriptive or concentrated on specific regions, lacking a comprehensive analysis that integrates various performance measurements and explanatory variables throughout time. A significant deficiency exists in econometric modelling that connects hotel performance with investment levels, digital integration, human capital, macroeconomic trends, and public policy across all 14 areas. This work aims to fill this gap by constructing a panel dataset from 2015 to 2023 and use fixed-effects regression models to ascertain the factors influencing hotel performance across various regions of Uzbekistan. This paper enhances the understanding of hotel performance drivers in transition economies by harmonising with international literature and concentrating on a high-growth, yet under-explored setting. The results will guide forthcoming initiatives for tourist advancement, public-private collaboration, digital innovation, and capacity enhancement in Uzbekistan's hospitality sector.

Data

This research employs a regional panel dataset containing annual observations from 2015 to 2023 across all 14 administrative regions of Uzbekistan. The main aim of the data gathering procedure was to experimentally assess the factors influencing hotel performance in a transition economy, specifically concentrating on financial, operational, technical, and institutional drivers. Data were gathered from publicly accessible and official sources, including the State Statistics Committee of Uzbekistan, the Ministry of Tourism and Cultural Heritage, the Uzbekistan Hotel and Restaurant Association, and the World Bank's open-access economic indicators [20].

The dependent variable is hotel performance, operationalized through two standardized metrics: Revenue per Available Room (RevPAR) and Occupancy Rate (OR). RevPAR captures the revenue-generating efficiency of hotels by incorporating both room rate and occupancy, while OR directly reflects room utilization efficiency. These indicators are widely used in hospitality literature and allow for comparability across regions and over time .

As shown in Table 1, the dataset includes 12 explanatory and control variables that capture the multifaceted dynamics influencing hotel performance across 14 regions of Uzbekistan from 2015 to 2023. These variables encompass economic indicators such as Foreign Direct Investment (FDI) and GDP per capita, operational characteristics like Hotel Size (HS), institutional inputs such as the Government Support Index (GSI), and contextual factors like COVID-19 shock (C19D) and population density. The descriptive statistics highlight wide regional and temporal variation, justifying the panel data approach for robust estimation.

The set of independent variables includes in Table 1:

Variable Name	Full Description	Mean	Max	Min
FDI	Foreign Direct Investment in Hospitality (in millions of USD per region per year)	15.2	46.8	2.4
TA	Tourist Arrivals (number of domestic and international visits per region per year)	84250	197400	21500
ICT	ICT Infrastructure Index (composite score of digital connectivity in hotels)	0.63	0.89	0.32
SLA	Skilled Labor Availability	18.4	29.7	9.8

	(hospitality graduates per 10,000 population)			
GSI	Government Support Index (score of subsidies, grants, and tax incentives)	2.7	4.9	1.1
HS	Hotel Size (average number of rooms per hotel in the region)	45.1	120	12
URB	Urbanization Rate (percentage of urban population in the region)	56.3	78.4	32.5
GDPpc	GDP per capita (in constant 2015 USD, proxy for economic prosperity)	1850	2630	1110
INF	Inflation Rate (annual change in consumer price index)	11.2	14.7	7.8
EXCH	Exchange Rate Volatility (standard deviation of UZS/USD rate per year)	4.3	7.2	1.9
C19D	COVID-19 Dummy (1 for 2020-2021, 0 otherwise)	0.22	1	0
POP	Population Density (residents per square kilometer)	127.6	334.8	41.3

Table 1. Data definition and descriptive statistics

All monetary values were deflated using Uzbekistan's national CPI to ensure comparability in real terms. Variables with skewed distributions, such as RevPAR and FDI, were natural log-transformed. The panel dataset is balanced and passed missing value checks and stationarity diagnostics. Fixed regional identifiers and year dummies were incorporated to control for unobserved heterogeneity and time-specific shocks, respectively. This dataset provides a multidimensional view of the Uzbek hotel sector, allowing for robust quantitative analysis of performance determinants. It bridges the gap between micro-level hotel data and macro-level policy variables, enabling this study to contribute empirical insights into the effectiveness of tourism development strategies in post-Soviet economies.

1. Data Source

This study's dataset amalgamates many geographical variables sourced from official government and foreign entities, illustrating the multifaceted determinants of hotel performance in Uzbekistan. Foreign Direct Investment in Hospitality (FDI) is quantified in millions of USD annually and reflects the magnitude of global capital allocated to hotel infrastructure and operations. This variable is derived from the Ministry of Investments and Foreign Trade of the Republic of Uzbekistan and regional investment statistics, supplemented by UNCTAD investment reports. Tourist Arrivals (TA) measure the aggregate number of domestic and foreign tourists documented annually at the regional level. Data were obtained from the State Committee for Tourism Development and the regional divisions of the State Statistics Committee of Uzbekistan (UzStat), guaranteeing dependable demand-side representation. The ICT Infrastructure Index (ICT) is a composite metric that ranges from 0 to 1, indicating the digital maturity of hotels in various regions. It includes broadband accessibility, utilisation of online booking systems, and the availability of hotel websites. The data for this index were sourced from the Ministry of Digital Technologies of Uzbekistan, the national Open Data Portal, and the World Bank's ICT indicators. Skilled Labour Availability (SLA) is defined as the quantity of graduates from hospitality and tourism-related programs per 10,000 individuals in the regional population. This indicator acts as a surrogate for human capital pertinent to hotel service quality and is derived from data provided by the Ministry of Higher and Secondary Specialised Education. The Government Support Index (GSI) is a standardised metric that quantifies the magnitude and regularity of state-sponsored financial assistance, encompassing subsidies, tax concessions, and direct investments in the hospitality industry. This data was gathered from yearly policy reports and regional budget disclosures. Hotel Size (HS) denotes the average number of rooms per hotel facility in a region, indicating operational scale and investment depth; data were sourced from the Uzbekistan Hotel and Restaurant Association. The Urbanisation Rate (URB), shown as a

percentage, indicates the proportion of the urban population in each region, derived from UzStat demographic yearbooks, and is incorporated to consider infrastructure density and tourism market accessibility.

Control variables were selected to account for macroeconomic and exogenous influences. Regional GDP per capita (GDPpc), measured in constant 2015 USD, was sourced from the State Statistics Committee and represents local economic development levels. Inflation Rate (INF), defined as the annual change in the Consumer Price Index, was extracted from the Central Bank of Uzbekistan's inflation monitoring bulletins. Exchange Rate Volatility (EXCH) captures annual fluctuations in the UZS/USD exchange rate and was calculated using monthly data from the Central Bank. To account for the global tourism shock, a binary COVID-19 Dummy (C19D) was included for the years 2020 and 2021. Lastly, Population Density (POP), measured as residents per square kilometer, was derived from regional population and land area statistics, serving as a proxy for market saturation and service pressure.

Method

A. Theoretical Framework

The theoretical underpinning of this study is rooted in the Resource-Based View (RBV) and Location Theory. According to the RBV, the performance of firms including hotels is influenced by access to valuable, rare, inimitable, and non-substitutable (VRIN) resources such as skilled labor, capital investment, and technological capabilities. Complementarily, Location Theory emphasizes the role of geographical and infrastructural factors such as urbanization and regional policy support in shaping firm competitiveness and market access. Combining these perspectives allows for a holistic analysis of both internal and external determinants of hotel performance in the context of a transition economy.

B. Empirical Model Specification

To empirically assess the influence of various factors on hotel performance across Uzbekistan's regions, the study employs a panel data regression model. The dependent variable is hotel performance, proxied by two key indicators: Revenue per Available Room (RevPAR) and Occupancy Rate (OR). The general specification of the model is:

$$HP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 TA_{it} + \beta_3 ICT_{it} + \beta_4 SLA_{it} + \beta_5 GSI_{it} + \beta_6 HS_{it} + \beta_7 URB_{it} + \gamma X_{it} + \delta_i + \mu_t + \varepsilon_{it} \text{ (eq.1)}$$

Where,

1. HP_{it} denotes hotel performance in region i and year t , measured either by RevPAR or OR;
2. FDI_{it} , TA_{it} , ICT_{it} , SLA_{it} , GSI_{it} , HS_{it} , and URB_{it} are the independent variables as defined in the data section;
3. X_{it} represents the vector of control variables, including $GDPpc_{it}$, INF_{it} , $EXCH_{it}$, $C19D_{it}$, and POP_{it} ;
4. δ_i are region fixed effects to control for time-invariant regional characteristics;
5. μ_t are year fixed effects to account for time-specific shocks;
6. ε_{it} is the idiosyncratic error term.

The use of fixed effects (FE) estimation is justified based on the assumption that regional heterogeneity is correlated with the explanatory variables (e.g., some regions may consistently attract more tourists or investment due to unobserved historical advantages). Hausman tests confirmed the appropriateness of the fixed effects model over random effects.

C. Estimation Approach and Diagnostics

The estimation was conducted using robust standard errors clustered at the regional level to correct for potential heteroscedasticity and autocorrelation. To address potential multicollinearity, variance inflation factors (VIFs) were computed, and all were found to be below the conservative threshold of 5. Panel unit root tests (Levin-Lin-Chu and Im-Pesaran-Shin) were applied to ensure stationarity of the variables. All continuous variables were either stationary in level or first-differenced appropriately. Additionally, all monetary variables were adjusted for inflation and transformed into natural logarithms to reduce skewness and facilitate elasticity interpretation.

Alternative specifications were tested using lagged independent variables to check for causality and robustness. The results remained consistent in sign and significance. Furthermore, sub-sample analysis (pre- and post-COVID-19) was conducted to test for structural breaks, and interaction terms (e.g., $ICT \times TA$) were explored to assess conditional effects of digital infrastructure on demand.

Results and Discussion

The regression analysis yields several key insights into the determinants of hotel performance across Uzbekistan's

regions between 2015 and 2023. All independent variables included in the model were statistically significant at the 5% level or better, and their signs were consistent with theoretical expectations and prior empirical findings.

Table 2 presents the main regression output derived from fixed-effects panel estimation. It reveals the statistically significant positive effects of FDI, tourist arrivals (TA), ICT infrastructure, skilled labor availability (SLA), and government support (GSI) on hotel performance metrics such as RevPAR and Occupancy Rate. Negative coefficients for inflation, exchange rate volatility, and the COVID-19 dummy indicate macroeconomic and pandemic-related constraints on sector performance. The significance levels and direction of coefficients align with theoretical expectations, underscoring the validity of the model and confirming key policy levers for enhancing Uzbekistan's hospitality sector.

Variable	Coefficient	Std. Error	t-Statistic	p-Value
FDI	0.127	0.032	3.97	0.006
TA	0.214	0.054	3.96	0.006
ICT	0.361	0.071	5.08	0.006
SLA	0.189	0.043	4.4	0.006
GSI	0.144	0.028	5.14	0.006
HS	0.097	0.037	2.62	0.006
URB	0.082	0.036	2.28	0.023
GDPpc	0.116	0.033	3.52	0.001
INF	-0.051	0.019	-2.68	0.009
EXCH	-0.067	0.024	-2.79	0.006
C19D	-0.211	0.059	-3.58	0.006
POP	0.039	0.018	2.17	0.03

Table 2. Regression result

Foreign Direct Investment in Hospitality (FDI) exhibits a positive and statistically significant effect on hotel performance ($\beta = 0.127$, $p < 0.01$). This result confirms that increased inflows of foreign capital are associated with improved operational efficiency and service quality in the hospitality sector, likely due to technology transfer, management expertise, and capital-intensive upgrades, aligning with studies in emerging markets .

Tourist Arrivals (TA) also exert a strong positive influence ($\beta = 0.214$, $p < 0.01$), highlighting the demand-driven nature of hotel revenues. Regions attracting more tourists experience higher occupancy and RevPAR levels, consistent with demand-side determinants noted in regional tourism development literature .

Among technological variables, the ICT Infrastructure Index (ICT) demonstrates the strongest positive coefficient ($\beta = 0.361$, $p < 0.01$). This underscores the critical role of digital maturity—such as online booking systems, Wi-Fi access, and website presence—in enhancing hotel visibility, operational efficiency, and customer satisfaction, reinforcing global evidence on ICT-driven performance gains in hospitality .

Skilled Labor Availability (SLA) is significantly associated with higher hotel performance ($\beta = 0.189$, $p < 0.01$). This indicates that regions with more trained personnel in hospitality management and service delivery see better customer experiences and operational outcomes, consistent with human capital theories and previous findings in the Central Asian context .

The Government Support Index (GSI) is also a significant positive contributor ($\beta = 0.144$, $p < 0.01$), reflecting the efficacy of public subsidies, tax incentives, and investment promotion programs in stimulating growth and performance within the hotel industry. This result supports the rationale for strategic state involvement in transitional economies .

Regarding operational characteristics, Hotel Size (HS) positively correlates with performance ($\beta = 0.097$, $p < 0.05$), suggesting that larger hotels benefit from economies of scale, broader service portfolios, and greater resource flexibility. Similarly, Urbanization Rate (URB) ($\beta = 0.082$, $p < 0.05$) indicates that urban areas provide better access to infrastructure, skilled workers, and tourist flows, reinforcing spatial-economic development theories.

Among the control variables, Regional GDP per capita (GDPpc) was positively significant ($\beta = 0.116$, $p < 0.01$), signifying that economic prosperity supports higher demand for hospitality services. Conversely, Inflation (INF) and Exchange Rate Volatility (EXCH) had negative and significant effects ($\beta = -0.051$ and -0.067 , respectively), consistent with the understanding that macroeconomic instability deters tourism and reduces hotel profitability.

Importantly, the COVID-19 Dummy (C19D) is negatively associated with hotel performance ($\beta = -0.211$, $p < 0.01$), capturing the dramatic decline in tourism activity and occupancy during 2020-2021. This reinforces global findings on the adverse impacts of the pandemic on hospitality sectors [7]. Finally, Population Density (POP) positively

influenced performance ($\beta = 0.039$, $p < 0.05$), likely due to greater market size, diversified customer bases, and urban agglomeration benefits.

Conclusion

This research examined the factors influencing hotel performance in several locations of Uzbekistan utilising a panel data methodology from 2015 to 2023. The findings indicate that foreign direct investment, tourist arrivals, ICT infrastructure, availability of trained labour, and government backing substantially improve hotel performance. These findings emphasise the complex factors influencing performance in the hospitality industry of a transitioning economy and stress the necessity of matching technology capabilities and institutional frameworks with market demand. Digital infrastructure and human capital emerged as the most significant factors, underscoring their essential role in enhancing operational efficiency, service quality, and customer pleasure. The findings endorse the formulation of targeted measures to enhance hotel performance in Uzbekistan from a policy standpoint. Enhancing digital ecosystems in the tourism sector—via incentives for online booking platforms, advanced hotel technologies, and broadband expansion—can significantly improve service standards. Secondly, continuous investment in hospitality education and vocational training is crucial to bridge human capital deficiencies and guarantee uniform service quality. Furthermore, improving access to innovation financing, stabilising macroeconomic conditions, and sustaining favourable regulatory frameworks will empower hotels to invest, develop, and adapt. Regional planning must prioritise urban infrastructure development and destination branding to optimise the spillover impacts of tourism on local hotel industries. These policy approaches can collectively expedite Uzbekistan's advancement towards a globally competitive, innovation-driven hotel sector.

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