DIGITAL BOOKING PLATFORMS AND INBOUND TOURISM PERFORMANCE: EVIDENCE FROM EU COUNTRIES

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Abstract
This study examines the relationship between digital booking platform activity and inbound tourism growth across the 27 European Union member states during 2019–2024. Using harmonized Eurostat data and an unbalanced panel of 153 country-year observations, the analysis applies pooled OLS, fixed effects, two-way fixed effects, and random effects models. Digital booking activity is measured through guest nights booked via major online platforms, while inbound tourism performance is proxied by non-resident nights spent in tourist accommodation establishments. The results indicate that platform booking activity has a positive and statistically significant effect on inbound tourism nights across all model specifications. In the preferred two-way fixed effects model, a 1% increase in platform-mediated bookings is associated with an approximately 0.69% increase in inbound tourism nights. Internet penetration is also statistically significant, although its negative coefficient suggests heterogeneous relationships between digital maturity and tourism performance across EU destinations. The study highlights the value of platform-generated Eurostat data as macro-level indicators for tourism information systems research and tourism market analysis.

Keywords: digital booking platforms, online travel agencies, inbound tourism, panel data, information systems, European Union.

JEL Classification: O33, L83, L86, Z32

1. Introduction

The digitalization of tourism has fundamentally transformed the way travel is planned, booked, and experienced. Online booking platforms have become central actors in tourism distribution systems, allowing travelers to access accommodation, compare prices, and complete reservations rapidly through digital applications and mobile devices. At the same time, these platforms have contributed to operational efficiency, broader market access, and increased visibility for tourism businesses [1]. As a result, digital booking systems are no

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longer merely supplementary distribution channels but are increasingly dominant components of the European tourism ecosystem.

The expansion of platform-mediated tourism is particularly visible in the European Union. According to Eurostat [2], guests spent 854.1 million nights in short-term rental accommodation booked through platforms such as Airbnb, Booking, Expedia Group, and Tripadvisor in 2024, representing an increase of 18.8% compared with 2023. This upward trajectory has remained consistent in recent years, reflecting the accelerated digital transition of tourism services across EU member states. More broadly, the tourism sector has undergone a substantial technological transformation, progressively integrating AI-driven solutions, smart hospitality systems, digital platforms, and data-driven management tools into its operational and distribution processes [3].

Beyond technological change, tourism digitalization is also shaped by evolving consumer behavior and increasing digital dependency in travel planning processes. Digital technologies now play a significant role in tourism decision-making, while younger generations demonstrate higher levels of acceptance and use of online tourism services and digital platforms [4]. In parallel, the European Commission identifies digital transition as one of the strategic pillars supporting tourism competitiveness, resilience, and long-term recovery within the European Union [5].

Despite the rapid expansion of online booking platforms, empirical evidence regarding their relationship with broader tourism development at the EU country level remains relatively limited. In particular, comparatively few studies have employed harmonized Eurostat platform data within cross-country panel data frameworks. Existing research has predominantly focused on individual platforms, consumer adoption behavior, or single-country analyses, while macro-level comparative evidence for EU member states remains comparatively scarce. Therefore, this paper examines whether digital booking platform activity is associated with inbound tourism growth across EU countries.

2. Literature review

2.1 Digital transformation and online booking in tourism

The emergence of online booking systems represents one of the most significant dimensions of tourism digitalization. The conceptual foundations of digital tourism trace back to the emergence of e-booking as a distinct phenomenon. Online booking systems evolved from the first automated airline computer reservation systems (CRS) implemented on mainframes, through global distribution systems (GDS) serving as B2B distribution backbones, to the development of web-based booking engines that enabled self-service B2C travel distribution [6].

Simović et al. [7] argue that the development of e-booking systems enabled tourism services to become more accessible and operationally efficient through internet-based reservation systems and mobile-compatible applications. Digitalization has consequently altered both tourism consumption patterns and business operations.

More recent studies emphasize that digital transformation in tourism extends beyond simple online reservations. Bondarenko et al. [8] highlight the growing integration of smart tourism solutions, digital platforms, and data-driven business models within the post-pandemic tourism economy. Similarly, Zaharia [9] notes that contemporary tourists increasingly prefer personalized digital experiences supported by recommendation algorithms and AI-based tourism services. At the individual level, the adoption of online hotel booking platforms is significantly shaped by website quality, e-trust, and social presence, factors that vary across digital maturity contexts [10], suggesting that cross-country heterogeneity in platform uptake partly reflects differences in digital infrastructure and consumer trust.

As a result, digital platforms now play a broader economic role within tourism systems, influencing destination visibility, consumer choice, and accommodation distribution across markets. The design and feedback mechanisms of booking platforms, including star ratings and customer reviews, play a critical role in shaping user trust and decision-making [11]. The integration of artificial intelligence into hospitality management further extends the role of digital systems in tourism, with AI-driven tools contributing to enhanced guest experiences and sustainable operational practices [12].

2.2 Information systems and platform data in tourism research

Online booking platforms such as Airbnb, Booking.com, and Expedia function not only as economic intermediaries, but also as large-scale information systems that continuously collect, process, and distribute transactional data across both the supply and demand sides of the tourism market [6,13]. From an information systems perspective, these platforms operate as multi-sided digital infrastructures that reduce information asymmetry between hosts and guests, automate matching processes, facilitate real-time transactions, and generate extensive data streams regarding tourism activity [1].

The growing importance of platform-generated data has significantly expanded the analytical possibilities for tourism research. A major institutional development occurred following the 2020 data-sharing agreements between the European Commission and four major platforms — Airbnb, Booking, Expedia, and Tripadvisor — which enabled Eurostat to publish harmonized statistics on short-stay accommodation bookings across EU member states [2]. The availability of these harmonized datasets represents an important advancement for tourism and information systems research, providing more consistent and comprehensive indicators of platform-mediated tourism activity across Europe [14].

At the individual level, previous studies have demonstrated that information system quality plays a central role in shaping user behavior and platform adoption. Factors such as system reliability, information accuracy, interface usability, e-trust, and social presence significantly influence user satisfaction, booking intention, and continued engagement with digital tourism platforms [10,15]. These findings suggest that the effectiveness of digital tourism platforms depends not only on technological availability, but also on broader dimensions of user trust and digital maturity.

Despite these developments, the use of platform-derived datasets in quantitative cross-country tourism research remains relatively limited. Most information system-oriented studies in tourism focus primarily on individual-level adoption behavior, examining the determinants of online booking intentions and user acceptance of digital platforms. Comparatively fewer studies employ aggregate platform data as macro-level indicators capable of capturing broader tourism system dynamics across countries.

This paper addresses that gap by treating the Eurostat platform dataset as a macro-level information systems indicator and applying panel econometric methods to examine its relationship with inbound tourism growth across EU member states.

2.3 Platform economy and tourism development in Europe

The expansion of collaborative economy platforms has generated increasing academic interest, particularly regarding their influence on tourism markets, accommodation systems, and destination development. Existing research has largely focused on individual platforms — especially Airbnb — or on specific national contexts, while broader comparative analyses at the European level remain relatively limited.

Mendieta-Aragón et al. [14] analyze the spatial distribution of tourism platform use across European regions and identify significant regional disparities in collaborative tourism intensity. Their findings suggest that platform-mediated tourism activity is unevenly distributed across Europe and shaped by structural regional characteristics, including tourism specialization, digital infrastructure, and socioeconomic development. These results indicate that the growth of platform-based tourism is not homogeneous across EU member states, but rather reflects broader territorial and economic inequalities.

The evolution of hospitality business models provides an additional perspective for understanding platform-driven tourism growth. Zeqiri [13] identifies several successive technological waves in the hospitality sector, arguing that the emergence of online travel agencies (OTAs) and collaborative economy platforms fundamentally transformed traditional tourism distribution channels. According to this perspective, digital platforms expanded market reach, facilitated real-time information exchange, and enabled increasingly data-driven service customization within the hospitality industry.

At the same time, the expansion of digital platforms has generated more complex competitive dynamics within tourism markets. While online platforms may stimulate aggregate tourism demand and improve destination visibility, they can also intensify competition for traditional accommodation providers and place pressure on profit margins through increased market transparency and price comparability. These dual effects illustrate the broader structural transformation generated by digital platform economies within tourism systems.

Additional research has examined the resilience of short-term rental platforms during periods of crisis. Adamiak [16] finds that short-term rental accommodation demonstrated relatively high resilience during the COVID-19 pandemic, particularly in domestic tourism markets, partly due to the flexibility and adaptability of platform-based accommodation models. Ibănescu et al. [17] further discuss the role of collaborative economy platforms in supporting tourism resilience across EU member states during periods of market disruption.

Beyond economic performance, the expansion of platform-mediated tourism has also generated sustainability-related concerns. Nunes et al. [18] argue that dominant booking platforms may contribute to the standardization of tourism offers, potentially disadvantaging smaller local businesses and reducing destination distinctiveness in peripheral regions. Similarly, Arzoumanidis et al. [19] show that major booking platforms were relatively slow to integrate sustainability criteria into accommodation search systems, with only a limited number of eco-friendly filtering options available prior to 2020. These findings suggest that the rapid growth of digital tourism platforms has not always been fully aligned with broader sustainable tourism objectives.

2.4 Research gap

Existing research remains limited in three respects. First, much of the literature focuses on individual platforms or single-country contexts, limiting EU-wide comparative evidence. Second, harmonized Eurostat platform-generated tourism data remain underutilized in empirical tourism and IS research. Third, comparatively few studies examine whether digital booking platform activity is statistically associated with inbound tourism performance using panel econometric methods. Accordingly, this study addresses these gaps through a cross-country panel analysis of EU member states.

3. Hypotheses

Based on the existing literature on digital tourism, online booking platforms, and tourism digitalization, the present study proposes the following hypotheses:

H1: *Digital booking platform activity has a positive and statistically significant effect on inbound tourism nights across EU countries.*

Online booking platforms reduce information, search, and transaction costs while increasing destination visibility, market accessibility, and consumer convenience, thereby supporting tourism demand growth and expanding tourism distribution channels [1,7].

H2: *Internet penetration is significantly associated with inbound tourism growth across EU countries.*

Digital infrastructure facilitates access to online tourism services and supports the broader adoption of digital booking platforms and tourism-related applications. As such, internet penetration is expected to influence tourism performance, although the direction and magnitude of this relationship may vary across structurally diverse EU tourism economies depending on destination characteristics and tourism specialization [4,8].

H3: *GDP per capita is positively associated with inbound tourism growth across EU countries.*

Higher levels of economic development are generally associated with better tourism infrastructure, stronger service capacity, greater digital adoption, and increased investment in tourism-related technologies, all of which may contribute to higher tourism activity and platform market development [13,20].

4. Data and methodology

4.1 Data Sources and Samples

This study employs an unbalanced panel dataset covering the 27 European Union member states over the period 2019–2024, resulting in 153 country-year observations. All data were obtained from Eurostat using the Eurostat package in R.

The selected time period corresponds to the availability of harmonized statistics on short-term accommodation bookings through major online platforms following the data-sharing agreements established between the European Commission and Airbnb, Booking.com, Expedia Group, and Tripadvisor [2]. These agreements enabled the publication of consistent cross-country platform booking data across EU member states from 2019 onwards.

The panel is unbalanced due to incomplete reporting for several member states in 2020, mainly associated with disruptions in tourism data collection during the COVID-19 pandemic. One missing observation for internet penetration (Ireland, 2022) was imputed using the arithmetic mean of the adjacent years 2021 and 2023. Table 1 presents the variables included in the analysis, while Table 2 reports the corresponding descriptive statistics.

The dependent variable, ln(NIGHTS), measures the natural logarithm of total nights spent by non-residents in tourist accommodation establishments and serves as a proxy for

inbound tourism performance at the country level. The variable is sourced from the Eurostat dataset tour_occ_ninat.

Variable/ Symbol	Role	Description	Source	Expected Sign
Inbound tourism nights/ ln(NIGHTS)	Dependent	Total nights spent by non-residents in tourist accommodation	Eurostat, tour_occ_ninat	—
Platform bookings/ ln(PLATFORM)	Independent	Guest nights booked via online platforms (Airbnb, Booking, Expedia, Tripadvisor)	Eurostat, tour_ce_omr	+
GDP per capita/ ln(GDPPC)	Control	GDP per capita at current prices (EUR per inhabitant)	Eurostat, nama_10_pc	+
Internet penetration/ INTERNET	Control	Share of households with internet access (% of total households)	Eurostat, isoc_ci_in_h	+
Accommodation capacity/ ln(BEDS)	Control	Total bed places in tourist accommodation establishments	Eurostat, tour_cap_nat	+

Table 1. Variable Description[3]

The main independent variable, ln(PLATFORM), captures the natural logarithm of guest nights booked through major online accommodation platforms, including Airbnb, Booking.com, Expedia Group, and Tripadvisor. Sourced from the Eurostat dataset tour_ce_omr, this variable operationalizes platform-mediated tourism activity and represents the main information systems-related indicator examined in the study.

Three control variables are included in the regression framework. ln(GDPPC) measures GDP per capita at current prices (EUR per inhabitant) and controls for the level of economic development across countries. INTERNET captures the share of households with internet access and serves as a proxy for digital infrastructure and technological accessibility.

[3] Note: Data cover 27 EU member states, 2019–2024. Panel is unbalanced (N = 153) due to missing observations for nine countries in 2020.

Finally, ln(BEDS) measures the total number of bed places in tourist accommodation establishments and controls for accommodation capacity at the national level.

All continuous variables, with the exception of INTERNET, are transformed into natural logarithms in order to reduce skewness and allow coefficient interpretation in elasticity terms.

Table 2 presents the descriptive statistics for the variables included in the analysis. Considerable variation can be observed across EU member states regarding inbound tourism activity, platform-mediated accommodation bookings, and accommodation capacity, reflecting structural differences in tourism specialization and digital adoption levels. The relatively moderate skewness and kurtosis values suggest that the variables exhibit acceptable distributional properties for panel econometric analysis.

Variable	**N**	**Mean**	**Std. Dev.**	**Min**	**Median**	**Max**	**Skewness**	**Kurtosis**
ln(NIGHTS)	153	16.20	1.39	13.39	16.18	19.30	0.17	−0.71
ln(PLATFORM)	153	15.34	1.48	11.98	15.33	18.52	0.08	−0.62
ln(GDPPC)	153	10.33	0.56	9.13	10.27	11.75	0.37	−0.28
INTERNET	153	91.49	4.66	75.07	92.30	99.18	−0.84	0.61
ln(BEDS)	153	12.25	1.32	9.57	12.13	14.64	0.07	−0.64

Table 2. Descriptive Statistics[4]

Figure 1 illustrates the spatial distribution of platform-mediated accommodation bookings across EU member states during the period analyzed. The highest levels are concentrated in Mediterranean tourism-oriented economies, particularly Spain, Italy, and France, reflecting the strong integration of digital booking platforms within major inbound tourism destinations.

[4] Note: Continuous variables are reported in logarithmic form, except INTERNET, which is expressed as a percentage.

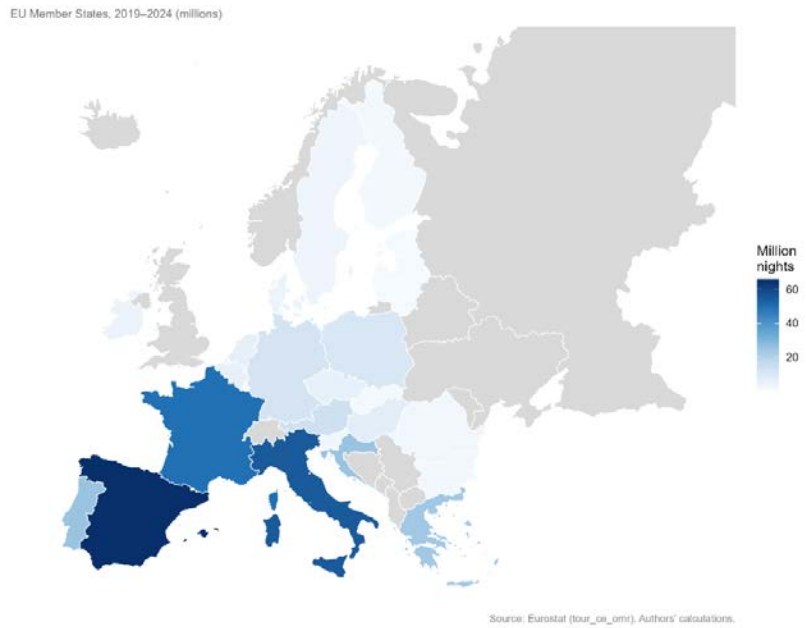

Figure 1. Spatial Distribution of Platform-Mediated Accommodation Bookings Across EU Member States (2019–2024 Average)

Table 3 presents the correlation matrix for the variables included in the analysis. The results indicate a strong positive correlation between inbound tourism nights and platform-mediated accommodation bookings ($r = 0.940$, $p < 0.001$), providing preliminary support for the expected positive association between digital booking platform activity and tourism performance.

	ln(NIGHTS)	**ln(PLATFORM)**	**ln(GDPPC)**	**INTERNET**	**ln(BEDS)**
ln(NIGHTS)	1.000				
ln(PLATFORM)	0.940***	1.000			
ln(GDPPC)	0.042	−0.053	1.000		
INTERNET	−0.020	−0.043	0.725***	1.000	
ln(BEDS)	0.851***	0.811***	−0.073	−0.049	1.000

Table 3. Correlation Matrix[5]

[5] Note: *** $p < 0.001$. High correlation between ln(GDPPC) and INTERNET ($r = 0.725$) is noted; VIF diagnostics confirm multicollinearity remains within acceptable bounds.

A similarly strong positive relationship is observed between inbound tourism nights and accommodation capacity ($r = 0.851$, $p < 0.001$).A relatively high correlation is also identified between GDP per capita and internet penetration ($r = 0.725$, $p < 0.001$), reflecting the close relationship between economic development and digital infrastructure across EU member states. However, subsequent variance inflation factor (VIF) diagnostics confirm that multicollinearity remains within acceptable limits for regression analysis.

Overall, the correlation structure provides preliminary descriptive insights into the relationships among the variables, while the multivariate panel regressions provide the main basis for hypothesis testing.

4.2 Econometric Model

The empirical analysis employs a panel data regression framework estimated using the following baseline specification:

$$\ln(NIGHTS)_{it} = \alpha + \beta_1 \ln(PLATFORM)_{it} + \beta_2 \ln(GDPPC)_{it} + \beta_3 INTERNET_{it} + \beta_4 \ln(BEDS)_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

where i denotes country ($i = 1, \ldots, 27$) and t denotes year ($t = 2019, \ldots, 2024$). The term μ_i captures country-specific fixed effects, controlling for time-invariant characteristics across EU member states, such as geographic location, tourism specialization, and structural destination attributes. The term λ_t represents year fixed effects that account for common temporal shocks affecting all countries simultaneously, including the COVID-19 pandemic and the subsequent tourism recovery period. The error term is denoted by ε_{it}.

All models are estimated using the plm package in R. To evaluate the robustness of the results, four model specifications are reported: pooled OLS (Model 1), one-way fixed effects with country effects only (Model 2), two-way fixed effects including both country and year effects (Model 3), and random effects (Model 4).

The two-way fixed effects specification is considered the preferred model, as it controls simultaneously for both cross-country heterogeneity and common time-specific effects. The choice between fixed and random effects specifications was further evaluated using the Hausman test [21] (Hausman, 1978).

To address heteroskedasticity and serial correlation within panels, robust HC3 standard errors clustered at the country level are reported for the fixed effects models. In addition, variance inflation factor (VIF) diagnostics indicate that multicollinearity does not represent a significant concern, with all VIF values remaining below the conventional threshold of 5 (ln(PLATFORM) = 2.93, ln(GDPPC) = 2.11, INTERNET = 2.11, and ln(BEDS) = 2.94).

5. Results and discussion

The estimation results are presented in Table 4, which reports four model specifications: pooled OLS (Model 1), one-way fixed effects (Model 2), two-way fixed effects (Model 3), and random effects (Model 4). The Hausman test does not reject the null hypothesis of no systematic difference between fixed and random effects estimators ($\chi^2 = 5.008$, $p = 0.286$). Nevertheless, the two-way fixed effects specification with robust HC3 standard errors (Model 3) is retained as the preferred model on theoretical grounds, as it controls simultaneously for country-specific heterogeneity and common temporal shocks affecting EU member states during the study period, including the COVID-19 pandemic and the subsequent tourism recovery phase.

	(1) OLS	(2) FE One-Way	(3) FE Two-Way	(4) RE
ln(PLATFORM)	0.6830***	0.9785***	0.6879***	0.9085***
	(0.0374)	(0.0319)	(0.0693)	(0.0268)
ln(GDPPC)	0.4255***	−0.2218	0.2716	0.2850*
	(0.0831)	(0.2085)	(0.1751)	(0.1289)
INTERNET	−0.0299**	−0.0275***	−0.0169**	−0.0405***
	(0.0101)	(0.0078)	(0.0084)	(0.0066)
ln(BEDS)	0.2869***	0.1599	0.0370	0.0728
	(0.0419)	(0.2515)	(0.1788)	(0.0638)
Constant	0.5487	—	—	2.1273
	(0.7619)			(1.1507)
Observations	153	153	153	153
R^2	0.9206	0.9402	0.6362	0.9322
Adj. R^2	0.9185	0.9255	0.5274	0.9303
F-statistic	429.19***	479.24***	51.15***	1980.68***
Hausman test	—	—	χ^2= 5.008, p = 0.286	—

Table 4. Panel Regression Results — Dependent Variable: ln(NIGHTS)[6]

[6] *Note: Standard errors in parentheses. For Models 2 and 3, robust HC3 standard errors clustered by country are reported. Model 3 (two-way FE with robust standard errors) is the preferred specification. * p < 0.05; ** p < 0.01; *** p < 0.001.*

The overall fit of Model 3 is satisfactory, with an R^2 of 0.636 and an F-statistic significant at the 0.1% level, confirming the joint explanatory power of the regressors within the fixed effects framework.

Figure 2 visually illustrates the positive relationship between platform-mediated accommodation bookings and inbound tourism nights across EU member states over the 2019–2024 period. The upward trend observed across the sample is consistent with the econometric findings reported in Table 4.

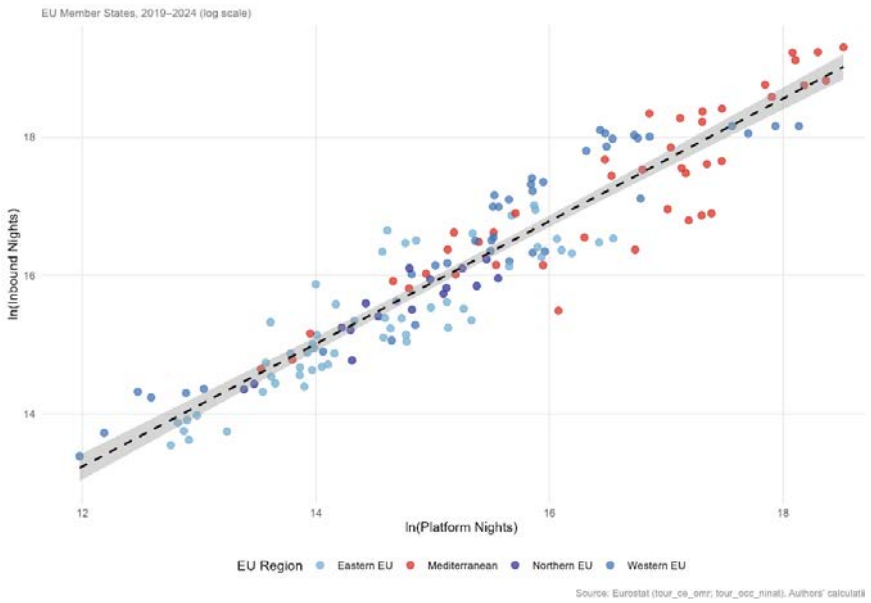

Figure 2. Relationship Between Platform-Mediated Accommodation Bookings and Inbound Tourism Nights Across EU Member States

Hypothesis 1. The coefficient of ln(PLATFORM) is positive and statistically significant across all model specifications, providing strong support for H1. In the preferred two-way fixed effects model, the estimated elasticity is 0.688 ($p < 0.001$), indicating that a 1% increase in guest nights booked through online platforms is associated with an approximately 0.69% increase in inbound tourism nights, ceteris paribus.

This finding is consistent with previous research emphasizing the role of online booking platforms in reducing transaction costs, improving destination visibility, and facilitating tourism demand growth [1,6,7]. The results further support the broader platform economy literature identifying OTAs and collaborative booking systems as important drivers of tourism market expansion across European destinations [13,14].

From an information systems perspective, the findings also highlight the analytical relevance of platform-generated tourism data as macro-level indicators capable of capturing tourism market dynamics across EU countries.

Hypothesis 2. The coefficient of INTERNET is statistically significant across all model specifications, providing support for H2. However, the estimated coefficient is negative across all models ($\beta = -0.017$, $p < 0.05$ in Model 3), indicating that the relationship between internet penetration and inbound tourism growth is more nuanced than a simple positive association.

One possible explanation is that several highly digitalized northern European economies exhibit very high levels of internet penetration while simultaneously recording lower inbound tourism intensity compared with Mediterranean tourism-oriented destinations such as Spain, Italy, Greece, and Croatia. The findings therefore suggest that digital infrastructure alone does not automatically translate into higher inbound tourism activity, particularly within structurally diverse destination economies characterized by different tourism specialization patterns.

Hypothesis 3. The coefficient of ln(GDPPC) is not statistically significant in the fixed effects specifications, although it remains positive and significant in the pooled OLS and random effects models. This pattern suggests that much of the explanatory power of GDP per capita is associated with structural cross-country differences, rather than short-term within-country variation over the study period.

The result is broadly consistent with panel data findings in tourism economics, where fixed effects specifications absorb a substantial part of the long-run structural heterogeneity across countries.

The coefficient of ln(BEDS) is not statistically significant in the fixed effects specifications, suggesting limited within-country variation in accommodation capacity over the analyzed period. However, the variable remains positive and statistically significant in the pooled OLS model, indicating that accommodation capacity continues to represent an important structural determinant of inbound tourism activity in cross-sectional comparisons across EU member states. Although a relatively strong correlation is observed between ln(GDPPC) and INTERNET, VIF diagnostics confirm that multicollinearity does not materially affect the reliability of the coefficient estimates.

Overall, the results provide empirical evidence that digital booking platform activity represents a statistically robust and economically meaningful predictor of inbound tourism growth across EU member states. The estimated platform elasticity in the preferred specification suggests that the continued expansion of platform-mediated accommodation bookings is likely to support further growth in inbound tourism activity across the European tourism market.

The findings also highlight the growing relevance of platform-generated datasets for tourism and information systems research. From a policy perspective, the continuation of institutional data-sharing initiatives between the European Commission and major online booking platforms appears justified, as harmonized platform statistics provide valuable indicators for monitoring tourism market developments at the EU level.

From an information systems perspective, the study demonstrates that platform-generated data can serve as meaningful macro-level indicators for analysing tourism system performance across countries, extending existing tourism IS research beyond individual-level adoption behaviour toward broader system-level analysis.

6. Conclusions

This study examined the relationship between digital booking platform activity and inbound tourism growth across the 27 EU member states over the period 2019–2024 using an unbalanced panel dataset and a two-way fixed effects econometric framework. The findings provide empirical evidence that digital booking platforms represent a significant component of contemporary tourism market dynamics within the European Union.

The empirical results indicate that platform-mediated accommodation bookings are positively and significantly associated with inbound tourism performance, with the preferred model suggesting an elasticity of approximately 0.69. Internet penetration also emerges as a statistically significant factor, although the negative estimated relationship highlights the structural heterogeneity of European tourism economies and suggests that digital maturity does not translate uniformly into stronger inbound tourism performance. By contrast, GDP per capita does not remain significant in the fixed effects specifications, indicating that its explanatory role is primarily associated with long-run structural differences across countries rather than short-term within-country variation.

From a theoretical perspective, the study contributes to the literature in several ways. First, it provides one of the first panel data analyses employing harmonized Eurostat platform booking statistics to examine inbound tourism performance across all EU member states. Second, it reinforces the relevance of online booking platforms as large-scale information systems capable of generating meaningful macro-level indicators for tourism analysis. Third, the findings demonstrate the analytical potential of platform-generated datasets for extending tourism information systems research beyond individual-level adoption studies toward broader system-level empirical analysis.

The study also carries practical policy implications. The positive association identified between platform booking activity and tourism performance supports the continued development of institutional tourism data infrastructures, including the maintenance and expansion of Eurostat's cooperation with major online booking platforms. At the same time, the heterogeneous effects associated with internet penetration suggest that digital

infrastructure investments may generate differentiated tourism outcomes depending on destination structure and tourism specialization across EU economies.

Several limitations should be acknowledged. The relatively short time period limits the identification of long-run dynamics, while the country-level nature of the analysis does not capture regional heterogeneity within EU member states. In addition, the possibility of endogeneity between platform activity and tourism demand cannot be fully excluded.

Future research could extend the analysis through longer time series, regional-level datasets, and additional platform-related indicators such as listing density, pricing structures, or review-based reputation measures. Further investigation of the negative relationship identified for internet penetration may also provide valuable insights into the complex interaction between digital maturity and tourism specialization across European destinations.

References

[1] Vlahović, O., Rađenović, Ž., Perović, D., Vujačić, V., & Davidović, K. *Digital Transformation in Tourism: The Role of E-Booking Systems*. Croatian Regional Development Journal, *5*(2), 129-145, 2024. https://doi.org/10.2478/crdj-2024-0012

[2] Eurostat. *Short-stay accommodation offered via online collaborative economy platforms*. Statistics Explained, 2025. Available online: https://ec.europa.eu/eurostat/statistics-explained

[3] Patrichi, I.C. *AI solutions for sustainable tourism management: A comprehensive review*. Journal of Information Systems & Operations Management, 18(1), 172–185, 2024. Available online: https://jisom.rau.ro/Vol.18%20No.1%20-%202024/JISOM%2018.1_172-185.pdf

[4] Ivancsóné Horváth, Zs., Kupi, M., & Kundi, V. *Digitalization and tourism: How X, Y, and Z generations make travel decisions in the online era.* GeoJournal of Tourism and Geosites, 60(2spl), 1302–1314, 2025. https://doi.org/10.30892/gtg.602spl26-1502

[5] European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, *Transition pathway for tourism*, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2873/344425

[6] Goecke, R. *The evolution of online booking systems.* In Z. Xiang, M. Fuchs, U. Gretzel, & W. Höpken (Eds.), Handbook of e-Tourism. Springer, Cham, 2021. https://doi.org/10.1007/978-3-030-05324-6_27-2

[7] Simović, O., Rađenović, Ž., Perović, D., & Vujačić, V. *Tourism in the digital age: E-booking perspective.* ENTRENOVA - ENTerprise REsearch InNOVAtion Journal, 6(1), 616-627, 2020. Available online: https://ojs.srce.hr/entrenova/article/view/13515

[8] Bondarenko, S., Kalaman, O., & Danilova, O. *Digital transformation of the tourism business in an open economy: A comprehensive approach to travel planning and partnerships*. Social Development: Economic and Legal Issues, (4), 2025. https://doi.org/10.70651/3083-6018/2025.4.17

[9] Zaharia, R. M., Barbu, C. A., & Georgescu, C. E. *Smart Tourism and Digital Experience: Tools, Platforms and User Preferences in the Post-COVID Context*. Ovidius University Annals, Series Economic Sciences, 25(1), 2025. Available online: https://stec.univ-ovidius.ro/html/anale/ENG/2025i1/Section%204/27.pdf

[10] Cobanoglu, C., & Nizamd, A. *Determinants of online hotel booking intentions: website quality, social presence, affective commitment, and e-trust*. Journal of Hospitality Marketing & Management, 30(7), 845–870, 2021. https://doi.org/10.1080/19368623.2021.1899095

[11] Albesher, Abdulmohsen Saud, Fatimah Alhelel, and Abdul-Rahim Ahmad. *Digital information systems in hospitality: A comparative study of user feedback and rating mechanisms across booking websites*. IEEE Access , 2025 Available online: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=11123712

[12] Patrichi, I. C. *Smart hospitality: the role of AI in enhancing sustainable guest experiences*, J. Inf. Syst. Oper. Manag., vol. 19, no. 1, pp. 241-258, 2025. Available online: https://jisom.rau.ro/Vol.19%20No.1%20-%202025/JISOM%2019.1_241-258.pdf

[13] Zeqiri, A. *From Traditional to Digital: The Evolution of Business Models in Hospitality Through Platforms*. Platforms, 2(4), 221-233, 2024. https://doi.org/10.3390/platforms2040015

[14] Mendieta-Aragón, A., Rodríguez-Fernández, L., & Navío-Marco, J. *Tourism usage of digital collaborative economy platforms in Europe: Situation, behaviours, and implications for digital policies*. Telecommunications Policy, 49(1), 102874, 2025. https://doi.org/10.1016/j.telpol.2024.102874

[15] Masri, N.W.; You, J.-J.; Ruangkanjanases, A.; Chen, S.-C.; Pan, C.-I. *Assessing the Effects of Information System Quality and Relationship Quality on Continuance Intention in E-Tourism*. Int. J. Environ. Res. Public Health 17, 174, 2020. https://doi.org/10.3390/ijerph17010174

[16] Adamiak, C. *Current state and development of Airbnb accommodation offer in 167 countries*. Current Issues in Tourism, 25(19), 3131–3149, 2022. https://doi.org/10.1080/13683500.2019.1696758

[17] Ibănescu, B.-C., Ursache, I.-M., Bejenaru, I., & Kulíš, Z. *Are collaborative economy platforms an engine for tourism resilience? Evidence from the European Union*. Eastern Journal of European Studies, 15(2), 211–230, 2024. https://doi.org/10.47743/ejes-2024-0211

[18] Nunes, J., Mata, D., Ribeiro, F., & Metrôlho, J. *Digital platforms to promote sustainable and authentic tourism in low-density territories of Southern Europe: Challenges and opportunities.* Sustainability, *17*(13), 6156, 2025. https://doi.org/10.3390/su17136156

[19] Arzoumanidis, I., Walker, A.M., Petti, L., *Online booking platforms: Towards making more sustainable choices*. Tourism Management Perspectives, 43, 100996, 2022. https://doi.org/10.1016/j.clpl.2022.100009

[20] Eurostat. *Tourism statistics — annual results for the accommodation sector*. Statistics Explained, 2025. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_statistics_-_annual_results_for_the_accommodation_sector

[21] Hausman, J.A. Specification tests in econometrics. *Econometrica* **1978**, 46(6), 1251-1271.

Bibliography

Adamiak, C. *Current state and development of Airbnb accommodation offer in 167 countries.* Current Issues in Tourism, 25(19), 3131–3149, 2022. https://doi.org/10.1080/13683500.2019.1696758

Albesher, A.S., Alhelel, F., & Ahmad, A.-R. *Digital information systems in hospitality: A comparative study of user feedback and rating mechanisms across booking websites.* IEEE Access, 2025. Available online: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=11123712

Almeida-Santana, A., David-Negre, T., Moreno-Gil, S., *New digital tourism ecosystem: understanding the relationship between information sources and sharing economy platforms.* International Journal of Tourism Cities, Vol. 6 No. 2 pp. 335–345, 2020. https://doi.org/10.1108/IJTC-09-2019-0173

Arzoumanidis, I., Walker, A.M., Petti, L., *Online booking platforms: Towards making more sustainable choices*. Tourism Management Perspectives, 43, 100996, 2022. https://doi.org/10.1016/j.clpl.2022.100009

Bondarenko, S., Kalaman, O., & Danilova, O. *Digital transformation of the tourism business in an open economy: A comprehensive approach to travel planning and partnerships*. Social Development: Economic and Legal Issues, (4), 2025. https://doi.org/10.70651/3083-6018/2025.4.17

Capineri, C., & Romano, A. *The platformization of tourism: From accommodation to experiences.* Digital Geography and Society, 2, 100012, 2021. https://doi.org/10.1016/j.diggeo.2021.100012

Cobanoglu, C., & Nizamd, A. *Determinants of online hotel booking intentions: website quality, social presence, affective commitment, and e-trust.* Journal of Hospitality Marketing & Management, 30(7), 845–870, 2021. https://doi.org/10.1080/19368623.2021.1899095

European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. *Transition pathway for tourism*. Publications Office of the European Union, 2022. https://data.europa.eu/doi/10.2873/344425

Eurostat. *Short-stay accommodation offered via online collaborative economy platforms.* Statistics Explained, 2025. Available online: https://ec.europa.eu/eurostat/statistics-explained

Eurostat. *Tourism statistics — annual results for the accommodation sector*. Statistics Explained, 2025. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_statistics_-_annual_results_for_the_accommodation_sector

Goecke, R. *The evolution of online booking systems*. In Z. Xiang, M. Fuchs, U. Gretzel, & W. Höpken (Eds.), Handbook of e-Tourism. Springer, Cham, 2021. https://doi.org/10.1007/978-3-030-05324-6_27-2

Hausman, J.A. *Specification tests in econometrics.* Econometrica, 46(6), 1251–1271, 1978.

Ibănescu, B.-C., Ursache, I.-M., Bejenaru, I., & Kulíš, Z. *Are collaborative economy platforms an engine for tourism resilience? Evidence from the European Union*. Eastern Journal of European Studies, 15(2), 211–230, 2024. https://doi.org/10.47743/ejes-2024-0211

Ivancsóné Horváth, Zs., Kupi, M., & Kundi, V. *Digitalization and tourism: How X, Y, and Z generations make travel decisions in the online era*. GeoJournal of Tourism and Geosites, 60(2spl), 1302–1314, 2025. https://doi.org/10.30892/gtg.602spl26-1502

Masri, N.W., You, J.-J., Ruangkanjanases, A., Chen, S.-C., & Pan, C.-I. *Assessing the effects of information system quality and relationship quality on continuance intention in e-tourism.* International Journal of Environmental Research and Public Health, 17, 174, 2020. https://doi.org/10.3390/ijerph17010174

Mendieta-Aragón, A., Rodríguez-Fernández, L., & Navío-Marco, J. *Tourism usage of digital collaborative economy platforms in Europe: Situation, behaviours, and*

implications for digital policies. Telecommunications Policy, 49(1), 102874, 2025. https://doi.org/10.1016/j.telpol.2024.102874

Nunes, J., Mata, D., Ribeiro, F., & Metrôlho, J. *Digital platforms to promote sustainable and authentic tourism in low-density territories of Southern Europe: Challenges and opportunities*. Sustainability, 17(13), 6156, 2025. https://doi.org/10.3390/su17136156

Patrichi, I.C. *AI solutions for sustainable tourism management: A comprehensive review.* Journal of Information Systems & Operations Management, 18(1), 172–185, 2024. Available online: https://jisom.rau.ro/Vol.18%20No.1%20-%202024/JISOM%2018.1_172-185.pdf

Patrichi, I.C. *Smart hospitality: The role of AI in enhancing sustainable guest experiences.* Journal of Information Systems & Operations Management, 19(1), 241–258, 2025. Available online: https://jisom.rau.ro/Vol.19%20No.1%20-%202025/JISOM%2019.1_241-258.pdf

Pencarelli, T. *The digital revolution in the travel and tourism industry*. Inf Technol Tourism **22**, 455–476 (2020). https://doi.org/10.1007/s40558-019-00160-3

Simović, O., Rađenović, Ž., Perović, D., & Vujačić, V. *Tourism in the digital age: E-booking perspective*. ENTRENOVA – ENTerprise REsearch InNOVAtion Journal, 6(1), 616–627, 2020. Available online: https://ojs.srce.hr/entrenova/article/view/13515

Srivastava, V., Dixit, I., & Duggal, R. *The Evolution of Technology in the Service Sector Concerning Hospitality*. In Transforming the Service Sector With New Technology (pp. 509-532). IGI Global Scientific Publishing. 10.4018/979-8-3693-7447-4.ch031

Vlahović, O., Rađenović, Ž., Perović, D., Vujačić, V., & Davidović, K. *Digital transformation in tourism: The role of e-booking systems*. Croatian Regional Development Journal, 5(2), 129–145, 2024. https://doi.org/10.2478/crdj-2024-0012

Zaharia, R.M., Barbu, C.A., & Georgescu, C.E. *Smart tourism and digital experience: Tools, platforms and user preferences in the post-COVID context*. Ovidius University Annals, Series Economic Sciences, 25(1), 2025. Available online: https://stec.univ-ovidius.ro/html/anale/ENG/2025i1/Section%204/27.pdf

Zeqiri, A. *From traditional to digital: The evolution of business models in hospitality through platforms*. Platforms, 2(4), 221–233, 2024. https://doi.org/10.3390/platforms2040015

Zhang, Z., & Fu, R. J. C. *Accommodation Experience in the Sharing Economy: A Comparative Study of Airbnb Online Reviews*. Sustainability, 12(24), 10500, 2020. https://doi.org/10.3390/su122410500