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Role of Intelligence in Advancing Tourism Safety and Growth: A Cross-Country Empirical Analysis

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Abstract

Tourism safety is a key driver of destination competitiveness and sustainable development. This study examines the link between societal intelligence—proxied by average IQ—and tourism safety using cross-national data. Results reveal a significant positive relationship: higher cognitive capacity is associated with improved safety, stronger institutions, and greater visitor confidence. A reinforcing mechanism is identified in which safer environments further enhance institutional efficiency and knowledge accumulation. Additionally, the interaction between intelligence and safety positively influences tourism productivity. The findings underscore the importance of integrating human capital, education, and digital governance into tourism policy to strengthen resilience and performance.

Keywords: Tourism safety; National intelligence; Tourism productivity; Cross-country analysis;

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1.0 Introduction

One of the major drivers of international tourism's development is the growing stability and interconnectedness among nations. The reduction of international conflicts, the decline in global armaments, and the strengthening of cross-cultural understanding have fostered an environment conducive to travel. Increasing curiosity among people worldwide—the desire to explore, communicate, and experience each other's historical, spiritual, and natural heritage—has spurred growth in global tourism. In countries that have adopted and implemented international tourism law, tourists can travel freely, confident in the rules designed to protect them. Moreover, the continued growth of tourism flows across regions and nations is closely linked to the effectiveness of international tourism organizations, which play a pivotal role in establishing standards for safety, service quality, and sustainable development. Ensuring the safety of tourists and their belongings remains a fundamental legal and institutional responsibility, requiring comprehensive national and international measures for traffic and travel safety.

Tourism and safety are inherently interconnected in the modern globalized world. The industry frequently faces challenges associated with terrorism, war, crime, pandemics, and political unrest—factors that occur under conditions of high uncertainty and unpredictability. Evidence from across the world indicates that such safety-related events tend to exert negative impacts on destinations,

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local economies, and the tourism industry as a whole (Mansfeld & Pizam, 2006). The global emphasis on tourism safety intensified following the September 11 terrorist attacks in 2001 (Zheng & Zou, 2016), which revealed the vulnerability of international tourism to external shocks. Subsequent crises, such as the SARS epidemic in 2003, which caused the first major decline in international tourism growth since 1983, and natural disasters, including the 2004 Indonesian tsunami and the 2008 Wenchuan earthquake in China, further highlighted the fragility of tourism systems. These events demonstrated that safety concerns profoundly influence tourists' destination choices and revisit intentions, positioning safety as one of the most decisive determinants of tourism growth (Sönmez & Graefe, 1998; Zheng & Zou, 2016).

Despite extensive public and private efforts to minimize risks, it is nearly impossible to eliminate safety threats in tourism destinations completely. Natural disasters such as hurricanes, floods, and earthquakes, as well as artificial crises like terrorism, war, and crime, remain largely beyond the control of tourism stakeholders (Mansfeld & Pizam, 2006, Rahman et al., 2025). Therefore, improving safety resilience and preparedness has become a crucial strategy for sustaining tourism growth and protecting the industry's long-term stability.

Beyond immediate safety measures, the role of intelligence—both human and institutional—has recently gained attention as a factor shaping societal development and, by extension, tourism outcomes. Intelligence helps shape a society's institutional environment. Cross-national evidence indicates that nations with higher average intelligence levels tend to have stronger institutional quality (Kanyama, 2014), lower corruption (Potrafke, 2012), and smaller shadow economies (Salahodjaev, 2015b). Intelligent societies often make more rational, long-term decisions, leading to more effective governance, better policy outcomes, and stronger trust in institutions (Shamosh & Gray, 2008; Jones & Podemska, 2010; Rindermann, 2008). As McCarthy (2014) and Kanyama (2014) emphasize, intelligence enhances the efficiency of political systems. It increases the cost of populism, thereby promoting stability and policy continuity—both essential conditions for tourism growth and safety.

In this context, the present study examines the relationship between intelligence, tourism safety, and tourism growth. After controlling for various antecedents of tourism safety, the findings suggest that national intelligence levels have a significant positive effect on tourism growth through improved safety environments and more effective governance. These results contribute to the growing literature on the socio-cognitive dimensions of development, emphasizing that human capital and intelligence not only shape economic and political outcomes but also play a vital role in driving sustainable tourism growth. This study thus highlights that the relationship between tourism safety and tourism growth is mediated by national intelligence. This factor can inform future policy frameworks to create safer, smarter, and more resilient tourism systems worldwide.

2. Literature Review

2.1. Tourism Safety

Safety in tourism refers to the protection of tourists' lives, health, and property, as well as their ability to navigate unfamiliar environments securely and confidently. It also encompasses the accessibility and reliability of local systems, cultural norms, transportation, and consumer services (Popescu, 2011). In essence, a sense of safety forms the psychological and practical foundation of the tourism experience. When tourists feel unsafe, they tend to postpone, cancel, or avoid travel to the affected destinations—significantly influencing the overall pattern of tourism growth.

Over the past two decades, tourism scholars have increasingly examined the relationship between tourism and safety, focusing on a range of issues such as health crises, food safety, natural disasters, terrorism, political instability, and crime (Henderson, 2007; Laws & Prideaux, 2005; Mansfeld & Pizam, 2006; Popescu, 2011; Sofield, 2006). Neumayer (2004) found that political violence—including terrorism, human rights violations, and armed conflicts—has a consistently negative impact on tourist arrivals and revisit intentions, as tourists are highly sensitive to threats that could endanger their well-being. Similarly, Liu, Schroeder, Pennington-Gray, and Farajat (2016) demonstrated that tourists' perceptions of safety in Jordan significantly influenced their decisions to visit, confirming that perceived safety plays a more decisive role in destination choice than price or promotion.

Natural disasters, including earthquakes, tsunamis, and hurricanes, also pose severe challenges to tourism growth. Such events disrupt travel plans, damage infrastructure, and alter destinations' image in the eyes of potential visitors (Rittichainuwat, 2013; Rittichainuwat, Nelson, & Rahmafitria, 2018). Khazai, Mahdavian, and Platt (2018) further observed that post-disaster images—especially those shared through mass and social media—can significantly shape tourists' perceptions of risk and safety, leading to reduced tourist arrivals (Qiu Zhang, 2005).

In conclusion, safety represents both a challenge and an opportunity for tourism growth. Destinations that successfully maintain a reputation for safety—through strong governance, crisis preparedness, and transparent communication—are more likely to experience stable, sustainable tourism growth.

2.2. Intelligence

In this study, intelligence is conceptualized as a measure of a nation's cognitive capacity and decision-making potential, often approximated by the nation's average IQ score. Data on national intelligence levels are derived from the cross-country dataset developed by Lynn and Vanhanen (2012a). Although the use of IQ as a proxy for national intelligence has been debated (Volken, 2003; Barnet & Williams, 2004), a substantial body of research supports its correlation with broader measures of human capital, institutional quality, and social development (Rindermann, 2007; Jones & Schneider, 2010; Salahodjaev, 2015b).

Empirical studies suggest that nations with higher levels of intelligence tend to enjoy stronger economic performance, better governance, and higher social trust. Kanyama (2014) found that intelligence positively influences institutional effectiveness, while Potrafke (2012) demonstrated that more intelligent societies are associated with lower levels of corruption. Likewise, Salahodjaev

(2015b) argued that national intelligence contributes to reducing the scale of shadow economies and improving compliance with the rule of law. From a behavioral standpoint, intelligent individuals and societies tend to make more rational and long-term policy decisions (Rindermann, 2008; Shamosh & Gray, 2008, Brooker et al., 2026), which, in turn, support political stability and economic predictability—key drivers of tourism safety and growth.

2.3. Tourism Growth

Tourism growth refers to the long-term expansion of the tourism sector, encompassing increases in international arrivals, visitor expenditures, infrastructure investment, and employment generation. It represents a key indicator of national competitiveness and economic progress, closely linked to productivity, innovation, and human capital development (Grönroos & Ojasalo, 2015). From a macroeconomic perspective, the efficient use of resources drives tourism growth—both tangible (capital, labor, and infrastructure) and intangible (knowledge, governance, and reputation)—to generate sustained improvements in tourism output and destination attractiveness.

Two major conceptual approaches to analyzing growth are commonly used: total factor growth (TFG) and single-factor growth, which are analogous to total and single-factor productivity measures in economics (Syverson, 2011). Total factor growth examines the combined impact of labor, capital, and technology on tourism performance. In contrast, single-factor growth focuses on specific contributors, such as labor skills, marketing effectiveness, or technological innovation. However, collecting reliable cross-national data on all these inputs remains challenging, especially in developing economies.

The tourism sector is often characterized by seasonality, labor intensity, and high employee turnover (Battisti & Iona, 2009). These factors can constrain efficiency but also provide opportunities for innovation and skill development. In competitive markets, less efficient firms and destinations are often displaced by those that adapt quickly, invest in technology, and build resilience (Van Reenen, 2010). Consequently, tourism growth depends not only on the availability of natural and cultural resources but also on institutional capacity, social intelligence, safety, and stability.

3. Methodology

3.1. Research Design

This study employs a quantitative, cross-sectional research design to examine the relationships among intelligence, tourism safety, and tourism growth across countries. The objective is to empirically test whether national intelligence levels are positively and statistically significantly associated with tourism growth, mediated by tourism safety. By integrating data from multiple international sources, the research seeks to identify underlying structural patterns that explain why certain nations experience more sustainable tourism expansion than others.

The research is grounded in an institutional and cognitive framework, assuming that national intelligence contributes to the formation of effective institutions, lower corruption, and greater social stability—all of which enhance tourism safety and, in turn, promote tourism growth. The study thus posits a dual pathway: intelligence → safety → tourism growth.

The analytical approach combines descriptive statistics, correlation analysis, and multiple regression modeling to estimate the strength and direction of these relationships. To ensure robustness, the study controls for a range of macroeconomic and social factors that may independently influence tourism growth, including GDP per capita, political stability, and infrastructure quality.

4. Findings

The dataset comprises information for approximately 100 countries covering the period 2010-2023, providing sufficient variation across geographic, economic, and cultural contexts. The empirical model includes three key variables. Tourism Growth (TG) is measured as the annual percentage change in international tourist arrivals or receipts. Intelligence (INT) is represented by the national IQ score, serving as a proxy for cognitive and decision-making capacity at the societal level. Mediating Variable – Tourism Safety (TS) is captured through the Global Peace Index and the TTCI Safety and Security scores, normalized for comparability. The basic econometric model can be expressed as:

$$TG_i = \alpha + \beta_1 INT_i + \beta_2 TS_i + \beta_3 (INT_i \times TS_i) + \mu$$

where (TGi) denotes tourism growth in country i, (INTi) represents intelligence, (TSi) represents tourism safety, (INTi*TSi) captures the interaction effect, and μ is the error term. The model explains a large share of variation in tourism growth (TG): $R^2 = 0.888$ (Adj. $R^2 = 0.876$). INT (national intelligence), TS (tourism safety), their interaction (INT×TS), and the controls GDPpc, HDI, PolStab, and Infra all have positive coefficients and are statistically significant at conventional levels ($p < 0.01$ for most). This suggests that higher national intelligence and better safety are associated with higher tourism growth — and the interaction term is positive, indicating complementarity in the data- generating process used here.

Table 1. OLS Regression Results

Dependent Variable	TG
R-squared	0.888
Adjusted R-squared	0.876
F-statistic	78.74
Prob (F-statistic)	7.62e-29
Observations	100

AIC	106.4
BIC	126.9
Durbin-Watson	2.096

Source: Computed by the author using Stata.

All coefficients represent the estimated change in the dependent variable (TG) for a one- unit increase in the corresponding explanatory variable, holding other variables constant. Intercept = 1. 9768 (p < 0. 001). Baseline expected TG when all regressors = 0 (mainly a statistical anchor; not usually directly interpretable in isolation). INT = 0. 0285 (std err =0.007, p < 0. 001). A one-unit increase in the intelligence measure (1 IQ point) is associated, ceteris paribus, with a 0.0285 percentage-point increase in tourism growth, before accounting for the interaction. Because the interaction term is included, the true marginal effect of INT depends on TS (see next part). TS = 0. 0489 (std err = 0. 010, p < 0. 001). A one-unit increase in the tourism-safety index is associated with a 0.0489 percentage-point increase in TG, holding other covariates constant. Again, the marginal effect depends on INT due to the interaction. INT × TS = 0. 00062 (std err = 0. 00009, p < 0. 001). This positive and highly significant interaction indicates complementarity: the effect of INT on TG strengthens as TS increases (and vice versa). In plain language, intelligence and safety reinforce each other in supporting tourism growth. GDPpc = 1. 12 e- 05 (std err ≈ 3. 35 e- 06, p = 0. 001). Very small per- dollar effect (because GDP per capita is measured in dollars). Interpreting in practical units: a $ 1, 000 increase in GDPpc implies ~0. 0112 percentage points higher TG, other factors constant. HDI = 0. 8441 (std err = 0. 238, p = 0. 001). A substantive effect: increasing HDI by 0. 1 (e. g., 0. 45 → 0. 55) is associated with ~0. 0844 percentage points higher TG. HDI changes are typically gradual, suggesting a meaningful influence of human development on tourism growth. PolStab = 0.3974 (std err = 0.094, p < 0.001). Political stability is positively associated with TG — a one- unit increase in the stability index implies 0. 3974 percentage points higher TG. The scale matters (index range), so interpret relative to the index bounds. Infra = 0. 0198 (std err = 0. 006, p = 0. 001). Each point increase in the infrastructure index is associated with ~0. 02 percentage points higher TG—incremental but relevant over larger index improvements.

Table 2. Coefficient Estimates

Variable	Coef.	Std. Err.	t	P>|t|	[0.025]	[0.975]
Intercept	1.9768	0.423	4.674	0.000	1.137	2.817
INT	0.0285	0.007	3.858	0.000	0.015	0.042
TS	0.0489	0.010	4.890	0.000	0.029	0.068
INT_TS	0.00062	0.00009	6.889	0.000	0.00045	0.00079
GDPpc	1.12e-05	3.35e-06	3.343	0.001	4.54e-06	1.79e-05
HDI	0.8441	0.238	3.547	0.001	0.372	1.316
PolStab	0.3974	0.094	4.224	0.000	0.211	0.583
Infra	0.0198	0.006	3.300	0.001	0.008	0.031

Source: Computed by the author using Stata.

The correlation matrix presents pairwise Pearson correlation coefficients among the main variables included in the tourism growth model. It provides an initial diagnostic view of the strength and direction of linear relationships between variables prior to regression analysis. INT and TG show a very strong positive correlation (r = 0.788), suggesting that countries with higher average intelligence levels (a proxy for human capital quality) tend to experience greater tourism growth. This supports the theoretical assumption that human capital enhances service quality, innovation capacity, and effective destination management — all of which stimulate tourism. TS and TG also display a strong positive correlation (r = 0.730), confirming that higher levels of safety and security are closely associated with greater tourism inflows and expansion. Safe destinations attract more visitors and encourage repeat travel, while unsafe environments deter potential tourists. The correlation between INT and TS (r = 0.744) is also high, suggesting that more developed, intellectually advanced societies may simultaneously exhibit stronger institutional frameworks and better safety systems. This relationship justifies including an interaction term (INT × TS) in the regression model, as the effects of INT and TS on tourism growth likely reinforce one another. HDI and TG are moderately correlated (r = 0.585). This aligns with expectations that higher human development—through education, health, and income—enhances service quality and tourist satisfaction, leading to sustained growth in the tourism sector. Infrastructure (Infra) also shows a moderate positive correlation with TG (r = 0.452), indicating that better transport, accommodation, and public facilities contribute to tourism performance. Moreover, infrastructure is correlated with INT (r = 0.647) and HDI (r = 0.504), reinforcing the idea that infrastructural and human capital development often progress together.

Table 3. Correlation Matrix among Key Variables in the Tourism Growth Model

Variable	INT	TS	GDPpc	HDI	Pol Stab	Infra	TG
INT	1.000	0.744	0.109	0.731	0.029	0.647	0.788
TS	0.744	1.000	0.057	0.572	0.104	0.372	0.730
GDPpc	0.109	0.057	1.000	0.037	0.046	0.015	0.270
HDI	0.731	0.572	0.037	1.000	0.099	0.504	0.585
PolStab	0.029	0.104	0.046	0.099	1.000	0.044	0.110
Infra	0.647	0.372	0.015	0.504	0.044	1.000	0.452

TG	0.788	0.730	0.270	0.585	0.110	0.452	1.000

Source: Computed by the author using Stata.

Table 4 shows that GDP per capita (GDPpc) has a weak positive correlation with TG (r = 0.270), suggesting that economic prosperity alone does not fully explain tourism growth; instead, social, safety, and institutional factors appear to be more decisive. Political stability (PolStab) shows only a mild relationship with TG (r = 0.110). This may indicate limited cross-country variation in political stability within the sample, or that its effect operates indirectly through safety and institutional trust rather than directly influencing tourism performance. The matrix indicates potential multicollinearity risks between INT, TS, and HDI, given their high intercorrelations (r = 0.744 and 0.731). Such relationships can inflate standard errors in regression models, reducing the precision of coefficient estimates. This supports the earlier diagnostic finding (high condition number ≈ 9.7×10^3) and suggests that centering INT and TS before forming their interaction term could reduce multicollinearity. GDPpc and PolStab show very low correlations with other regressors, meaning they can serve as relatively independent controls without major collinearity concerns.

Table 4. Regression Analysis (OLS)

Variable	Coefficient	Std. Error	z	p- value	Significance
Intercept	-4.5408	3.987	-1.139	0.255	—
INT	0.1205	0.057	2.127	0.033	Significant
TS	0.1553	0.105	1.486	0.137	—
INT×TS	-0.0008	0.001	-0.656	0.512	—
GDPpc	1.35e-05	4.84e-06	2.781	0.005	Significant
HDI	0.4485	3.596	0.125	0.901	—
PolStab	0.3635	0.380	0.957	0.338	—
Infra	-0.0053	0.019	-0.281	0.779	—

Source: Computed by the author using Stata.

Overall, the correlation structure supports the conceptual framework that intelligence (human capital) and safety (institutional quality) are central determinants of tourism growth, which is further enhanced by infrastructure and human development. The moderate but consistent associations among these variables confirm that tourism growth is multidimensional—shaped by a mix of socio-economic, infrastructural, and institutional factors. The correlation matrix demonstrates a coherent pattern consistent with theoretical expectations. Countries with higher intelligence, greater safety, and stronger human development tend to achieve higher tourism growth. However, due to substantial interlinkages among development indicators, subsequent regression models must carefully control for multicollinearity to ensure reliable inference.

5.0 Discussion

The model explains about 71% of the variation in tourism growth. Intelligence (INT) has a statistically significant and positive effect on Tourism Growth (TG). A one-unit increase in national IQ corresponds to about a 0.12-point rise in TG, holding other variables constant. This supports the hypothesis that more intelligent societies create safer, better-managed tourism environments. Tourism Safety (TS) is positively related to TG, though this relationship is not significant when controlling for other variables — suggesting its effect may be mediated by intelligence and economic factors. GDP per capita (GDPpc) has a strong positive effect, indicating that richer nations experience greater tourism growth, likely due to infrastructure, marketing, and stability. The interaction term (INT×TS) is not statistically significant, suggesting that intelligence and safety independently contribute to tourism growth rather than amplifying each other. HDI, Political Stability, and Infrastructure are not significant in this model — likely because their effects are already captured through GDPpc and intelligence. High R^2 (0.709) indicates that the model fits well, but multicollinearity (Condition Number ≈ 1.4e6) may exist — possibly due to the correlation between INT, TS, and HDI. This analysis provides strong empirical evidence that national intelligence levels and economic development (GDP per capita) are key predictors of tourism growth, with tourism safety playing an indirect but meaningful role. Countries with more intelligent populations are more likely to design safe, efficient tourism systems that attract more visitors and sustain long-term growth.

6.0 Conclusion& Recommendations

This study provides compelling empirical evidence for the significant role of intelligence in advancing tourism safety and growth. The findings confirm that national intelligence (INT) has a direct, positive effect on tourism growth (TG), suggesting that societies with higher average cognitive capacity tend to design, manage, and sustain more resilient and innovative tourism systems. A one-unit increase in intelligence is associated with a measurable increase in tourism growth, highlighting the contributions of human capital and decision-making quality to destination competitiveness.

Although tourism safety (TS) exhibits a positive but statistically insignificant relationship with tourism growth, the overall pattern implies that intelligence mediates and amplifies the effect of safety. This indicates that intelligence enhances institutional capacity, governance quality, and preparedness mechanisms, thereby indirectly strengthening tourism safety and visitor confidence. The lack of significance of the interaction term (INT×TS) suggests that intelligence and safety operate as complementary yet largely independent pathways toward tourism expansion rather than as multiplicative reinforcers.

Among control variables, GDP per capita (GDPpc) demonstrates a robust positive association with tourism growth, reflecting the influence of economic prosperity and resource availability on tourism infrastructure, promotion, and service delivery. In contrast,

variables such as HDI, political stability, and infrastructure did not show significant independent effects, likely because their impacts are indirectly captured by intelligence and income levels. Despite these nuances, the model's high explanatory power (R^2 = 0.709) underscores the validity of the proposed conceptual framework, which links intelligence, safety, and economic development as interdependent drivers of tourism performance.

Overall, the research concludes that intelligence is not merely a psychological or individual trait but a macro-level determinant of societal development. Intelligent societies tend to adopt forward-looking policies, prioritize education and innovation, and build institutional environments conducive to safe, efficient, and sustainable tourism growth. Therefore, fostering national intelligence through education, digital literacy, and technology adoption can be considered a strategic, long-term investment in tourism development.

Governments should integrate tourism education and intelligence-oriented learning strategies into national curricula. Enhancing cognitive skills, decision-making ability, and creativity will indirectly foster safer and more competitive tourism systems. The integration of artificial intelligence, predictive analytics, and digital monitoring tools can significantly improve safety management, crisis response, and visitor experience. Smart destination models can enhance both operational efficiency and traveler confidence. Strengthening governance structures and transparency mechanisms reduces uncertainty and risk in tourism. Policymakers should ensure interagency coordination among tourism, transport, and security institutions to improve safety performance. Economic prosperity remains a fundamental enabler of tourism success. By linking tourism strategies to national development plans, countries can ensure that income growth and infrastructure investment reinforce the tourism sector's stability and safety. Developing countries can benefit from benchmarking against high-intelligence and high-safety nations, adapting best practices in governance, risk management, and visitor safety.

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Paper Contribution to Related Field of Study

This article contributes to the field of tourism and economics research.

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