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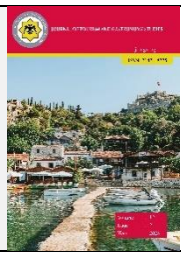

Does Tourism Opportunity or Threat to Green Economıc Growth? Evidence From The Top 10 Countries

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Abstract

The aim of the study is to examine the impact of tourism on green economic growth in the top 10 countries in international tourism (USA, Austria, Canada, France, Germany, Spain, UK, Italy, Greece, Mexico) using panel data analysis method for the period 2010-2022. In the study, control variables (energy and financial development variables) were used in addition to the tourism variable. This context, four models have been created. According to the findings, an increase in international tourism numbers reduces green growth. The variables of renewable energy and financial institutions are statistically insignificant; but the variables of fossil energy and financial markets have significant effects on green economic growth, with fossil energy having a negative impact and financial markets having a positive impact. It is expected that this study will contribute to the literature by being one of the first studies to examine the impact of work tourism on green economic growth.

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INTRODUCTION

Tourism has grown to be the largest and fastest-growing sector in the world, having a significant influence on both the environment and society. Therefore tourism development is identified as an important way to achieve the Sustainable Development Goals (SDG) agenda, which aims to achieve economic, social and environmental sustainability worldwide by 2030 (Razzaq et al., 2023). For instance, the international tourism industry experienced a rapid recovery in 2022, despite economic and geopolitical challenges, and reached a total of 7.7 trillion dollars with a yearly increase of 22%. This recovery represents 7.6% of the global economy in 2022. This contribution is the highest sector contribution since 2019 (WTTC, 2023). Additionally, the tourism industry's exports have increased to over 1.7 trillion dollars, surpassing the growth of the commercial goods industry. This makes the tourism industry a powerful force in the areas of foreign exchange transfers, socioeconomic development, job opportunities, and cutting-edge, innovative technologies (Lv et al., 2023). Owing to its combined effects on gross domestic product (GDP), employment, foreign exchange, and other areas, tourism is viewed as a driver of global economic growth. However, the true value of tourism lies not only in its contribution to economic growth, but also in its ability to impact the financial and socio-cultural progress of society, which is encouraged by tourists (Razzaq et al., 2023). For the purpose of enhancing the socio-economic conditions of the population, it is necessary to develop strategies that allow for maximum use of the positive aspects of tourist growth. However, it is important not to overlook the disadvantages of relying heavily on tourism as a means of development (Song, & Han, 2023). Since tourism has not been made sustainable, it can disrupt the momentum of economic growth. It is claimed that international tourism, for instance, promotes climate change through its impact on CO2 emissions. According to the 2021 data from the World Travel and Tourism Council (WTTC), tourism activities account for 11% of global CO2 emissions. It is expected that the rate would double by the year 2050. This situation has become a serious cause for concern for global economies (Razzaq et al., 2023). Despite significant economic growth, the tourism sector is consistently being blamed for its negative impact on the environment, particularly due to the increasing CO2 emissions (Lv et al., 2023).

Although the negative environmental impacts of tourism mentioned earlier are a concern, the emergence of the economic green recovery discourse in the post-corona period has also sparked interest in the eco-tourism or green tourism discussion among specialists (Shang, et al., 2023). The tourism industry's capacity to address environmental issues aligns with the "green growth" strategy implemented by the World Bank in 2012, which aims to tackle regional development imbalances, inadequacies, widening income-consumption gap, and environmental degradation (Li, et al., 2023; Shang, et al., 2023). The development objectives of social justice, natural environment preservation, and sustainable economic growth are all integrated by green growth. It serves as a crucial mechanism for advancing the establishment and sustainable progress of eco-civilization (Zhang, et al., 2022). Scientists propose the concept of "green growth" as a means to safeguard the environment and address the long-term challenge of climate change (Shang, et al., 2023). Consequently, the concept of green economic growth, which combines economic and environmental factors, is receiving growing recognition in various countries and areas. A development strategy that prioritizes green growth can significantly reduce the incentive for local governments to focus only on GDP-based economic growth. It can also strengthen the innate desire to reduce emissions, preserve energy, and use fewer resources. Additionally, it can foster healthy competition among various countries and regions (Zhang & Zhang, 2023).

Green growth was therefore a crucial strategic option for high-quality development (Li, et al., 2023). Hence, it is imperative to undertake rigorous endeavors to convert the global tourism sector into an environmentally sustainable entity, while considering the economic and environmental ramifications of international tourism. In this context, it is believed that the application of green technologies in the international tourism sector will play an effective role (Razzaq et al., 2023). For instance, it refers to the utilization of renewable energy sources in hotels and accommodations for tourists. Presently, the predominant source of energy utilized in hotels and tourist lodgings is derived from fossil fuels (Shang, et al., 2023). Through the mitigation of CO2 emissions associated with energy consumption, green technology innovation can support sustainable consumption habits in the global tourism industry. Similarly, green innovation can benefit the hospitality industry by making it possible for hotels to employ renewable energy, which lowers CO2 emissions associated with foreign travel. The demand for Information and Communication (ICT) in the tourism sector can be made more environmentally friendly by adopting green technologies that digitize this sector. Hence, these ecologically sustainable technologies can play a crucial role in mitigating the rise in CO2 emissions linked to energy consumption in the context of global tourism (Razzaq, et al., 2023). Specifically, the increase in tourist arrivals stimulates the development of tourism-related services, reducing the share of traditional agriculture and secondary industries and increasing the share of tertiary industries such as services in the national economy, promoting industrial structure optimization and green transformation (Zhang & Zhang, 2023). Hence, it is imperative that the tourism industry in this modern period focuses on achieving high standards and strictly adheres to the new development philosophy in order to guarantee the quality advancement of the sector (Zhang, et al., 2022).

The broad literature provides ample evidence of the substantial economic influence of tourism, as demonstrated by studies such as Zhang & Zhang (2021) and Nunkoo et al. (2020). Furthermore, there is evidence to suggest that tourism activities have contributed to environmental changes, as demonstrated by studies conducted by Peng et al. (2022) and Lv & Xu (2021). Tourism has the potential to have a substantial impact on green economic growth by simultaneously increasing economic output and reducing environmental pollution. Both of these factors are influenced by the rise of tourism (Zhang & Zhang, 2023). Despite the significant influence, there is a scarcity of research on the relationship between tourism and the green economic growth. For instance, Shang, et al. (2023) for Asian countries, Zhang, et al. (2022) and Lv, et al. (2023) for Chinese provinces and Zhang and Zhang (2023) studied for 308 Chinese cities.

Hence, it is crucial to examine the causal mechanism by which the high-quality development of the tourism industry affects inclusive green growth. This study aims to investigate the impact of tourism on green economic growth in the top 10 tourist destinations. The rationale for evaluating the 10 leading countries in the study is that the policies these countries will take in tourism will set an example in solving the problems of environmental degradation and climate change and will lead other countries to follow these policies. As the first study to examine a sample of the top 10 nations in tourism, it is anticipated that this research will make a valuable contribution to the existing body of literature.

The study consists of four sections. The first section is the introduction. The second section includes the theoretical framework and the studies conducted in the literature. The third section presents the dataset used in the study, the model and method employed, and the findings and conclusions in the last section.

Theoretical Framework and Literature Review

There exist four prevalent ideas concerning the correlation between tourism and economic growth. The tourism-oriented economic growth hypothesis (TLGH) posits that tourism leads to economic growth, emphasizing a unidirectional causality link. On the other hand, the economically focused tourism growth hypothesis (EDTH) suggests that economic growth influences the tourism industry in a one-way causality relationship. These two hypotheses are fundamental arguments that demonstrate the correlation between tourism and economic growth. The third hypothesis, bidirectional causality relationship (BC), posits a reciprocal causation connection between tourism and economic growth. The final hypothesis, absence of any relationship (NC), posits that, in contrast to the aforementioned three hypotheses, there is an absence of any correlation between the two variables in question. The aforementioned four hypotheses are applicable to the context of green economic growth and tourism, as stated by Shang et al. (2023). Figure 1 illustrates the visual representation of these hypotheses.

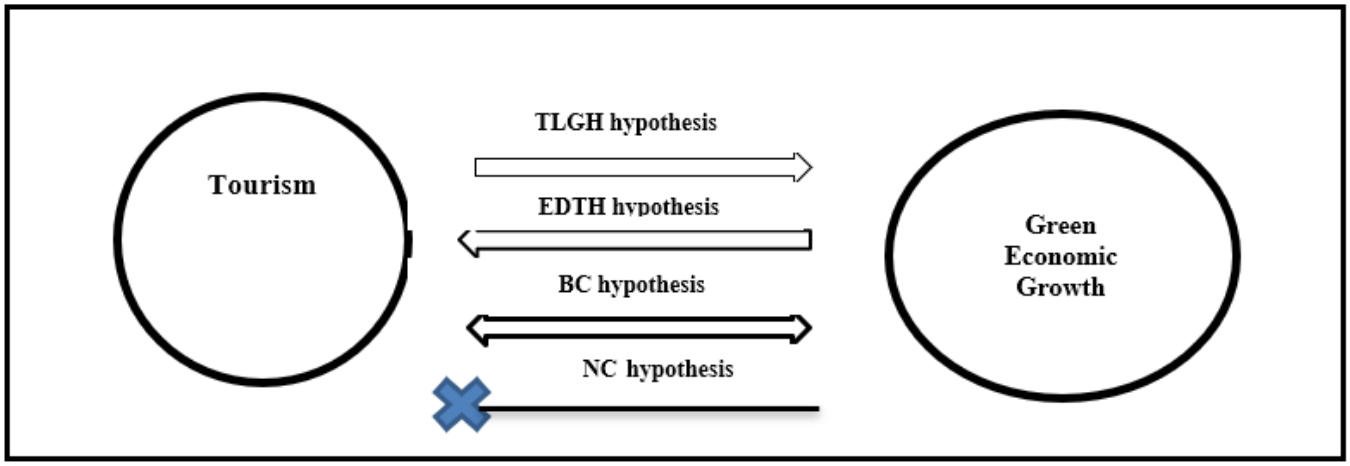

Figure 1. The relationship between tourism and green economic growth.

Source: Shang et al. (2023)

Clarifying the relationship between tourism and green economic growth would help to realize the benefits of the tourism sector while promoting the harmonious coexistence of economic and environmental systems. Numerous fascinating academic research topics have been sparked by the effects of tourism on economies and the environment. However, few studies have considered the impact of tourism on green development, which balances economic growth and environmental protection (Wu, et al., 2022). These studies utilize either samples from countries or samples from states and cities, employing the panel data analysis method. In a study published Shang et al. 2023 examined the impact of tourism and two distinct energy sources—renewable energy and fossil fuels—on the development of eco-friendly economies in Asian nations between 2000 and 2021. The findings show that, over time, the tourism sector contributes positively to long-term sustainable economic growth in wealthy Asian countries. But in low-income Asian economies, the development of tourism still poses a challenge to the attainment of sustainable economic growth. Moreover, for the two groups of economies under investigation, the use of fossil fuels inhibits the GDP's ability to increase sustainably. Suggested pragmatic measures for low-income Asian nations include the implementation of an ecotourism strategy, the promotion of green regionalism, and the establishment of a green financial market. Ahmad et al.'s (2022) study looked at how innovation and tourism affected the G7 economies' ability to grow sustainably between 2000 and 2019. The results indicate that improving technical education,

encouraging tourism development, and fostering innovation are the best ways for the G7 economies to achieve sustainable growth.

In studies on states and cities, Zhang, et al.'s (2022) study is to determine how the mechanism of import dependency in the inclusive green growth index impacts the high-quality development of the tourism industry in 30 Chinese provinces between 2010 and 2019. Empirical studies have demonstrated that the adoption of inclusive green growth methods can significantly improve the overall quality of the tourism industry. The findings indicate that despite favorable circumstances such as inclusive green growth, reliance on imported goods will adversely affect the advancement of the tourism industry in terms of quality. Zhang & Zhang (2023) conducted a study to analyze the impact of tourism on green development performance, specifically assessed as green total factor productivity, in 308 cities across China from 2005 to 2019. The findings demonstrate a curvilinear association between tourism and green total factor productivity, characterized by an inverted U-shaped pattern. Green total factor productivity change in cities is primarily driven by three factors: environmental improvement, industrial structure optimization, and technical innovation brought about by tourism. Furthermore, the correlation between tourism and Gross Tourism Footprint (GTFP) differs greatly among socio-economic development zones. Although there is a positive correlation in comparatively developed regions, less developed Western China still exhibits an inverted U-shaped association between tourism and GTFP. In 284 Chinese cities, Wu et al. (2022) investigate the linear and non-linear aspects of tourism's influence on green development. The main conclusions show that China's effectiveness in green development has been greatly enhanced by tourism. This demonstrates that tourism has emerged as a powerful catalyst for China's economic transition towards sustainability. The promotion of green development by tourism exhibits a non-linear threshold feature. This implies that as the development level of the tourism industry improves, there is a point at which it surpasses a particular threshold value and enters a higher level of tourism. The relationship between eco-friendly technology developments, sustainable tourism, financial development, economic growth, and ecological sustainability is examined in the study carried out by Lv, et al. (2023). The research makes use of Chinese regional data from 2000 to 2019. According to the study's findings, China's adoption of green technology and tourism has a long-term beneficial effect on lowering ecological footprints. Furthermore, the correlation between financial development and economic expansion directly contributes to an increase in ecological impact. Furthermore, the immediate outcomes demonstrate the same occurrence and validate that ecological advancements and tourism will contribute to the preservation of the natural environment.

Upon a comprehensive evaluation of the existing literature, it becomes evident that there is a scarcity of studies. These papers employ analysis techniques that rely on panel data. Furthermore, the vast majority of studies focus on the Chinese sample. Shang, et al (2023) conducted research on Asian countries, Ahmad, et al (2022) focused on G7 economies, Zhang, et al (2022) and Lv, et al (2023) studied the province of China, Wu, et al. (2022) investigated in 284 Chinese cities, and Zhang and Zhang (2023) examined 308 Chinese cities. Despite the existence of past studies, there is still a lack of academic research that specifically investigates the impact of tourism on the green economic growth of major tourist destinations. This paper aims to address the existing gap in the literature by employing the panel data approach and utilizing annual data from 2010 to 2022.

Data, Model, and Methodology

This section of the study examines the influence of tourism on the sustainable economic growth of the top 10 nations in the tourism industry from 2010 to 2022. Despite Turkey's fourth place ranking among the top 10 country in tourism in 2023, it was not included in the sample due to the unavailability of data on the green economic growth index. When considering the time frame from 2010 to 2022, the availability of nation data was considered. The study provides abbreviations, explanations, and sources of the variables in Table 1, while Table 2 presents descriptive data.

Table 1. Variables and Their Sources

Abbreviations	Variables	Source
GG	Green economic growth index	https://greengrowthindex.gggi.org/
TUR	Tourism (number of arrivals)	UNWTO Tourism Statistics Database
PC	Fossil fuels resources consumption	Our World in Data (https://ourworldindata.org/explorers/energy?)
REC	Renewable energy consumption	Our World in Data (https://ourworldindata.org/explorers/energy?)
FI	Financial institution index	IMF Database (https://data.imf.org/?sk=f8032e80-b36c-43b1-ac26-493c5b1cd33b)
FM	Financial market index	IMF Database (https://data.imf.org/?sk=f8032e80-b36c-43b1-ac26-493c5b1cd33b)

The study examines at the connections between a number of variables and the expansion of the green economy. The dependent variable is green economic growth, and the independent variable is tourism. As additional control variables, the study looks at energy (fosil and renewable) and financial development (financial markets and institutions). Also the logarithm of all variables has been taken to standardize the series and express the findings in terms of elasticity.

Panel Data

A panel data set is a data set that follows a sample of individuals over time and thus provides multiple observations on each individual in the sample. In other words, panel data analysis adds both a spatial and temporal dimension to regression analysis. The spatial dimension relates to a set of cross-sectional units of observation. These can be countries, states, counties, firms, commodities, groups of people or even individuals. The temporal dimension concerns periodic observations of a set of variables characterizing these cross-sectional units over a given time interval. Thus panel data analysis has several important advantages over traditional cross-sectional or time series data sets. Panel data usually provide the researcher with a large number of data points, increase degrees of freedom and reduce collinearity between explanatory variables. It therefore increases the efficiency of econometric estimation. Panel data can detect and measure statistical effects that time series or cross-sectional data cannot. It can minimize estimation biases that may arise from aggregating groups into a single time series. As such, it allows a researcher to analyze a range of important economic questions that cannot be addressed using cross-sectional or time series data sets. Because of these important advantages, panel data are widely used in both developed and developing countries (Hsiao, 2003; Eom, Lee, & Xu, 2008). Considering the panel data analysis, 4 models were created. These models are given below.

Model I: $\ln GG = \beta_{0it} + \beta_{1it} \ln TUR + \varepsilon_{it}$

Model II: $\ln GG = \beta_{0it} + \beta_{1it} \ln TUR + \beta_{2it} \ln PC + \beta_{3it} \ln REC + \varepsilon_{it}$

Model III: $\ln GG = \beta_{0it} + \beta_{1it} \ln TUR + \beta_{2it} \ln FI + \beta_{3it} \ln FM + \varepsilon_{it}$

Model IV: $\ln GG = \beta_{0it} + \beta_{1it} \ln TUR + \beta_{2it} \ln PC + \beta_{3it} \ln REC + \beta_{4it} \ln FI + \beta_{5it} \ln FM + \varepsilon_{it}$

In the equations, i = 1, 2, 3,……N refers to the cross section units, t = 1, 2, 3,……T refers to the time dimension, and ε refers to the panel error term.

France is the country that attracts the most tourists among the countries of the world when the tourism statistics of the countries are taken into account. It has been at the top of this list for many years, welcoming 79.4 million tourists in 2022. Spain ranks second among the world's top tourist destinations. The country was preferred by 71.7 million tourists in 2022. The USA ranks third among the world's top tourist destinations, welcoming 50.9 million tourists in 2022. Turkey ranks fourth with 50.5 million tourists. Italy is the fifth most popular tourist destination in the world. The country was visited by 49.8 million tourists in 2022. The sixth place in the list of the most tourist-attracting countries in the world is Mexico with 38.3 million tourist visits. Welcoming 31.9 million tourists in 2022, the UK was the seventh most visited country in the world. In eighth place was Germany, visited by 28.5 million tourists in 2022. Greece followed in ninth place, welcoming 27.8 million tourists. In tenth place was Austria with 26.2 million tourists. Although Canada ranked eleventh with 17.9 million tourists, Turkey was not included in the analysis due to the lack of access to green economic growth data for Turkey. Therefore, Canada was included in the analysis sample (TURSAB, 2022).

Table 2. Descriptive Statistics

	lnGG	**lnTUR**	**lnPC**	**lnREC**	**lnFI**	**lnFM**
Mean	1.81209	7.70097	4.49232	3.77345	-0.14129	-0.17137
Med.	1.812776	7.604598	4.432445	3.744978	-0.107489	-0.124364
Max	1.877544	8.338211	4.867939	4.519207	-0.017964	-0.022337
Min	1.724767	6.631657	4.166819	2.968658	-0.404693	-0.492744
SD	0.042545	0.381593	0.192246	0.375283	0.106823	0.126860
Skew.	-0.288904	-0.195430	0.769512	0.144660	-1.059917	-1.219335
Kurt	2.277416	2.599274	2.532766	3.036325	3.095370	3.506721
J-B	4.636606	1.697327	14.01240	0.460557	22.51394	31.01940
Prob	0.098441	0.427987	0.000906	0.794312	0.000013	0.000000
Sum	235.5718	1001.127	584.0026	490.5492	-16.95515	-20.56501
Obs	130	130	130	130	120	120

Table 2 provides a detailed statistical analysis of the variables to comprehensively examine the panel data. This analysis includes basic statistical indicators such as mean, median, range, minimum and maximum values, which provide key insights into the dataset. In addition, the standard deviation is calculated to assess the degree of deviation from the mean, indicating data variability over time.

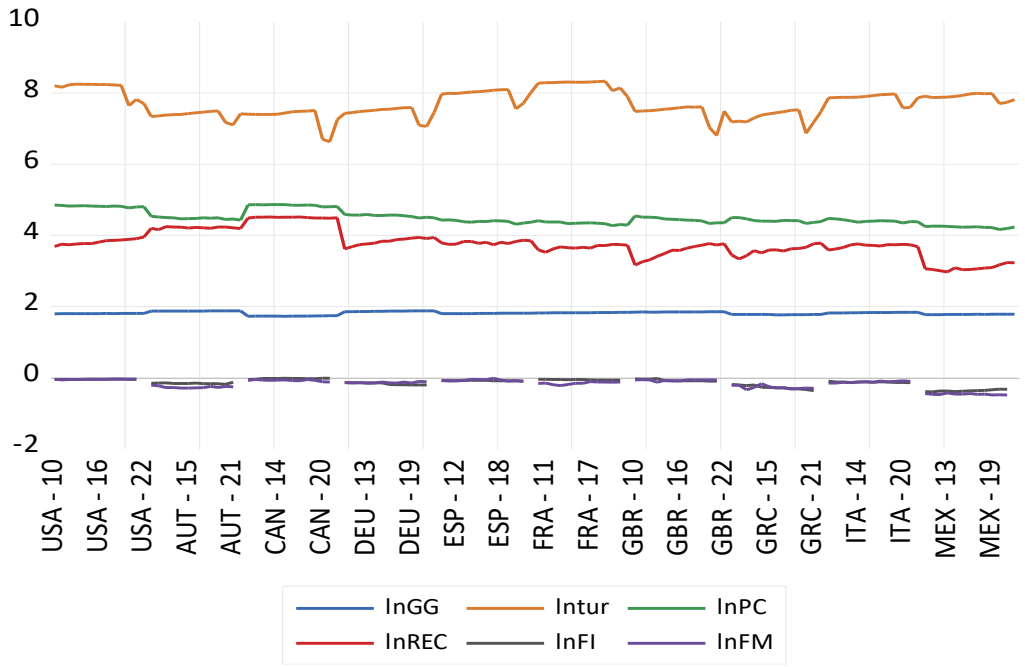

Figure 2. The indicators for countries

Figure 2 displays the indicators included in the analysis of the country. France, the USA, and Spain are the leading countries in international tourism. Regarding green growth metrics, while all countries are roughly at similar levels, Austria, Germany, England, and Italy exhibit a little superior performance compared to other nations. With the exception of Canada and the USA, other countries have lower primary energy consumption. However, when it comes to renewable energy consumption, Canada surpasses other countries in terms of consumption. Mexico has the lowest consumption rate among all countries. Countries other than Mexico, Greece, and Austria are more advantageous in terms of financial institutions and markets.

The efficacy of regression analysis is heavily contingent upon the correlation pattern of the independent variables. Strong correlation among independent variables leads to issues of multicollinearity. Multicollinearity leads to issues such as biased estimation of regression coefficients, higher variance and standard error of the coefficients, and decreased statistical power. Hence, it is necessary to evaluate the assumption of multicollinearity (Gujarati, 2011). The widely employed simple correlation matrix was utilized to ascertain this issue. A correlation coefficient greater than 0.9 in the correlation matrix suggests the presence of a significant multicollinearity issue between the two series (Asteriou, 2005).

Table 3. Correlation Matrix

	lnGG	**lnTUR**	**lnPC**	**lnREC**	**lnFI**	**lnFM**
lnGG	1					
lnTUR	-0.012700	1				
lnPC	-0.276945	-0.1480987	1			
lnREC	-0.036743	-0.356043	0.661062	1		
lnFI	0.066458	0.164564	0.598499	0.563671	1	
lnFM	0.104962	0.087689	0.581562	0.487029	0.880227	1

Table 3 indicates that the variable with the highest correlation coefficient is 0.88. This study also utilized the Variance Inflation Factor (VIF) test. This test assesses the deviation in p-values caused by inflated coefficients of standard errors in the regression model (Arvas, et al. 2023). The VIF values should be below 10.

Table 3. Multicollinearity test (dependent variable: lnGG)

Variables |	VIF	1/VIF
lnFI	5.93	0.168647
lnFM	4.70	0.212757
lnREC	2.58	0.387695
lnPC	2.12	0.472267
lnTUR	1.52	0.659347
Mean VIF	3.37	

According to the findings obtained from the VIF test, there is no multicollinearity based on the average VIF (3.37) and the individual VIF values of the independent variables are below 10. This indicates that multicollinearity is no longer a problem in the model. To determine the effect of tourism on green economic growth in the following phase, it is crucial to choose the right estimate method from the fixed effects model (FE), random effects model (RE), and classical model (Pooled). For this purpose, the Hausman test (H-Test), the Breusch-Pagan LM test, and the F test were used. Table 4 displays the test results.

Table 4. Results of F test, LM, and Hausman Test

Tests	**Type**	**Statis.**		**Effective Estimator**
F-Test	Pooled	F-sta.	1088.9	FE
	Fixed	Prob	0.00	
LM Test	Pooled	χ^2 sta.	627.65	RE
	Random	Prob> χ^2	0.00	
Hausman Test	Fixed	χ^2 sta.	0.16	RE
	Random	Prob	0.999	

The effective estimator was determined by a three-stage process. Firstly, an F-Test was conducted for Pooled with Fixed Effects. Secondly, an LM test was performed for Pooled with Random Effects. Lastly, a Hausman test was carried out for Fixed Effects with Random Effects. Hence, the RE model serves as the most efficient estimator.

Prior to addressing the solution for the models, it is imperative to ascertain the presence of autocorrelation, heteroscedasticity, and cross-sectional dependency (CSD) in the error terms of the models. The Levene, Brown, and Forsythe test is used to identify heteroskedasticity in panel groups. In this case, the RE model is the effective estimator. Additionally, the Durbin-Watson and Baltagi-Wu tests are also employed. The LBI tests were employed to identify autocorrelation, while the Pesaran tests were utilized for CSD. Table 5 contains the information regarding the testing.

Table 5. Heteroscedasticity, Autocorrelation, and CD Test Results

		Model I		**Model II**		**Model III**		**Model IV**	
	Tests	**Static.**	**Decision**	**Static**	**Decision**	**Static**	**Decision**	**Static**	**Decision**
HC	Levene, Brown, Forsythe	4.501	✓	7.532	✓	4.501	✓	4.501	✓
		0.000		0.000		0.000		0.000	
		4.341	✓	4.092	✓	4.341	✓	4.341	✓
		0.000		0.000		0.000		0.000	
		4.447	✓	7.324	✓	4.447	✓	4.447	✓
		0.000		0.000		0.000		0.000	
AC	D-W and Baltagi-Wu LBI	.3864	✓	.5249	✓	.4998	✓	.6687	✓
		.7587		.7902		.8448		.9602	
CD	Pesaran	13.62	✓	11.915	✓	5.672	✓	5.624	✓
		0.000		0.000		0.000		0.000	

Note: AC, Autocorrelation; HC, Heteroscedasticity; ✓, Available

In the error terms of every model, tests were run to determine the presence of heteroscedasticity, autocorrelation, and CSD. The findings show that the error terms in the models contain heteroscedasticity, autocorrelation, and CSD. According to these results, robust standard errors should be used to change standard errors so that the parameter estimations remain unaffected (Hoechle, 2007). Several resilient estimators have been devised to generate accurate predictions when faced with heteroscedasticity, autocorrelation, and CSD issues. An example of such an estimator is the one proposed by Arellano, Froot, and Rogers. The estimators proposed by Arellano, Froot, and Rogers can be applied to both random effects (RE) and fixed effects (FE) models where there is heteroskedasticity and autocorrelation. Nevertheless, the random effects (RE) model lacks a reliable estimator when confronted with heteroscedasticity, autocorrelation, and CSD. The estimators proposed by Arellano, Froot, and Rogers can be applied in this scenario (Driscoll and Kraay, 1998; Hoechle, 2007). Consequently, to address the issues of heteroscedasticity, autocorrelation, and CSD, the models employed the estimators proposed by Arellano, Froot, and Rogers. The results of the estimation are displayed in Table 6.

Table 6. Estimation Results

Dependent Variable (Green Growth)	**Model I**	**Model II**	**Model III**	**Model IV**
C	1.894* (.079)	2.137* (.159)	1.892* (.013)	2.060* (.079)
lnTUR	-.011* (.001)	-.0031 (.003)	-.0103* (.002)	-.0029 (.003)
lnPC		-.0716** (.015)		-.060*** (.019)
lnREC		.0053 (.0063)		.0148 (.003)
lnFI			-.0360 (.047)	.036 (.020)
lnFM			.0397*** (.022)	.0382** (.011)
R^2	.13	.39	.19	.42
Prob	0.000	0.000	0.000	0.000

Note: *, **, *** indicate the significance level of 0.01, 0.05, 0.1, respectively

All models analyzed in the study are generally significant. In Model I, the effect of the tourism variable on green growth was analyzed. The tourism variable is significant and has a negative sign. Accordingly, a 1% increase in the tourism variable reduces green growth by 011%. The next models are the models in which energy and financial development indicators are added and analyzed in addition to the tourism variable. In Model II, fossil energy and renewable energy were added as control variables and analyzed. Accordingly, a statistically significant 1% increase in fossil energy reduces green growth by 072%. The renewable energy variable is insignificant even though it has a positive sign. The tourism variable, which constitutes the purpose of the study, is insignificant and has a negative sign. In Model III, financial development indicators were added and analyzed in addition to the tourism variable. While the financial institution index, which is one of the financial development indicators, has an insignificant and negative sign, the financial market index has a significant and positive sign. Accordingly, a 1% increase in the financial market increases green growth by 04%. Although the tourism variable, which constitutes the purpose of the study, is significant with the addition of the financial development variable, its effect on green growth is still negative. In Model IV, all variables were included in the model and analyzed. In addition to the tourism variable, which

constitutes the purpose of the study, the variables of renewable energy and financial institutions are also meaningless. As in other models, fossil energy and financial market variables are significant. Fossil energy has a negative effect on green economic growth, while financial markets have a positive effect.

Conclusion

Tourism, known for its environmentally friendly and non-polluting nature, significantly contributes to global sustainable development. There is a growing global focus on green growth, which takes into account both economic and environmental factors. The objective of this study is to analyze the impact of tourism on the sustainable economic growth of 10 country that are prominent in the field of international tourism. The study examined four models. The study investigated the impact of tourism, the subject of the research, on green growth in Model I. Accordingly, an increase in international tourism numbers reduces green growth. Further models were examined by incorporating energy and financial development variables alongside the tourism variable. In the model including the energy variable, fossil energy and renewable energy control variables were used in Model II. Although fossil energy has a negative sign and renewable energy variable has a positive sign, renewable energy is insignificant. The tourist variable, which is the focus of the study, is statistically insignificant and exhibits a negative coefficient. In Model III, which incorporates financial development indicators, the financial institution index exhibits a statistically insignificant and negative coefficient, whereas the financial market index has a statistically significant and positive coefficient. While the tourism variable, which is the focus of the study, has a considerable impact on green growth when combined with the financial development variable, the overall effect is still negative. In Model IV, which incorporates all variables, the variables of renewable energy, financial institutions, and tourism are deemed insignificant. Similar to other models, the variables of fossil energy and financial markets play a significant role. Fossil energy has a negative impact on green economic growth, but financial markets have a positive impact. The impact of tourism on green economic growth is uncertain. Because the findings support both the TLGH hypothesis and the NC hypothesis. The results of these studies align with the research conducted by Shang, et al. (2023), Zhang & Zhang (2023), and Wu, et al. (2022), providing partial support for their conclusions. However, Lv, et al. (2023) contradicts their study. Shang, et al. (2023), Zhang & Zhang (2023), and Wu, et al. (2022) achieved outcomes in their research by considering the developmental stages of countries or cities, or a specific threshold value. Consequently, tourism contributes to sustainable economic growth in highly developed regions, but has adverse effects on less developed areas.

Some suggestions can be offered in line with the findings. From a policy perspective, the impact of the tourism variable on green economic growth is adverse. According to the research conducted by Song and Han (2023), it is crucial for the entire tourism industry to prioritize environmental sustainability and embrace greener practices. Authorities can also impose environmental fees in popular tourist areas to protect local wildlife. In addition, the government can make it easier for businesses to retain green and low-carbon technology and alternative energies for transportation, logistics, accommodation and other tourism-related activities, thereby reducing carbon dioxide emissions and minimizing the overuse of resources. This would effectively decrease CO2 emissions and mitigate excessive resource consumption. Consequently, there will be a chance to decrease CO2 emissions by means of enhanced tourism, advancements in public transportation, funding for energy efficiency, and improved waste management. Specifically, these nations must employ advanced, energy-efficient, and eco-friendly technology to

foster economic expansion and enhance environmental sustainability. It is crucial for achieving improved environmental sustainability and growth outcomes. Hence, it is imperative for their governments to endorse energy-efficient technologies. Given the evidence that financial markets contribute positively to the growth of environmentally friendly economies, it is advisable to enhance the green finance market in order to enhance the development of green sectors of the economy. Transparency of legislation, government assistance, and individual green consciousness are essential for the growth of the green financing business.

This study provides a valuable exploration of the complex relationship between tourism and green economic growth. The findings underscore the need for policies that promote sustainable tourism practices by considering both economic benefits and environmental sustainability. While the study makes an important contribution to the literature, further research is needed to examine in more detail the multifaceted impacts of tourism on the environment and the economy. Future studies could benefit from a more detailed explanation of the rationale behind the data collection processes and the choice of control variables. The inclusion of cultural and policy-related variables could offer deeper insights into how these factors may mediate the relationship between tourism and green economic growth. A comparative analysis with countries outside the top 10 in tourism could provide a broader understanding of the impact of tourism on green growth.

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