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CHANGES IN THE TRAVEL AND TOURISM DEVELOMPENT INDEX METHODOLOGY

Measuring indicators of tourism development is crucial for formulating effective tourism policies. The Travel and Tourism Development Index (TTDI) is intrinsically linked to the measurement of tourism development indicators. It provides the essential data and analysis needed for creating effective, sustainable, and competitive tourism policies, thereby maximizing the benefits of tourism while minimizing its adverse impacts. The TTDI has been published twice since its inception in 2021. Notably, the methodology for compiling the TTDI has changed to enhance its accuracy and relevance This paper aims to identify the degree of agreement between the new and the original calculation methodology in the TTDI values achieved by countries. In addition, we show the values achieved concerning the region in which the country is located and concerning the income group. Moreover, we quantify differences in the country's ranking between the original and new rankings within TTDI. The findings indicate that even with the revised methodology for calculating the TTDI, the values attained by the countries exhibit a strong correlation.

Keywords: travel, tourism, development, index, methodology.

1. INTRODUCTION

The travel and tourism industry holds significant importance for many countries worldwide, occupying a central role in their economies due to the substantial revenue it generates.

From an economic and social perspective, the growth of the travel and tourism industry leads to a rising demand for a diverse range of consumer goods and services. This demand stimulates both the manufacturing and service sectors, boosting economic activity and consumption beyond normal market trends. Consequently, the increase in tourism consumption, driven by large seasonal movements of people to popular destinations and a rising number of visitors, benefits the comprehensive development of the economies in these tourist areas and the overall economic landscape of countries investing in their tourism industry (Sofronov, 2018).

Tourism development policies are becoming increasingly vital for both, developing and developed countries. These policies not only bring a new sector into the national economy but also help achieve macroeconomic goals. Consequently, many countries focus their

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efforts on attracting foreign tourists to boost their foreign reserves. Tourism helps strengthen connections between nations, fosters understanding among different people and cultures, and contributes to global peace.

Measuring indicators of tourism development is essential for creating well-informed, effective, and sustainable tourism policies that maximize benefits and minimize adverse impacts. The Travel and Tourism Development Index (TTDI) serves as a comprehensive tool for measuring and analyzing the various indicators critical to tourism development. Each pillar of TTDI reflects indicators that help us assess strengths and weaknesses from a relational standpoint to identify opportunities for tourism development through strategies aimed at creating superior competitive advantages. General comments from the experts creating TTDI stimulate future research on tourism development.

Since its inception in 2021, the TTDI has been published twice. Significantly, the methodology for compiling the TTDI has been revised to improve its precision and pertinence. Therefore, this paper aims to identify the degree of agreement between the new and the original calculation methodology in the TTDI values achieved by countries.

2. TRAVEL AND TOURISM DEVELOPMENT INDEX

The tourism phenomenon is inherently complex, having significant social, political, cultural, and economic implications. A country's travel and tourism development should be viewed in a multidimensional context, as it is influenced by various factors that enhance its attractiveness as a tourist destination. Studies that carried out a literature review on tourism development have provided many variables. According to Chim-Miki and Batista-Canino (2018), tourism development indicators can generate collective results for both stakeholders and tourism destinations.

Since 2007, the World Economic Forum has published The Travel and Tourism Competitiveness Report (Blanke, Chiesa, 2007) to facilitate economic comparisons of travel and tourism competitiveness. The Travel and Tourism Competitiveness Index (TTCI) reflects countries' global tourism competitiveness standings, derived from a statistical database and expert evaluations. This report has been issued eight times, providing specific TTCI values for 2007, 2008, 2009, 2011, 2013, 2015, 2017 and 2019. The TTCI was constructed using several indicators that were aggregated into several pillars and then subindexes. The composition of the TTCI has varied over time. Figure 1 shows the names of the TTCI subindexes for 2007–2013 and 2015–2019.

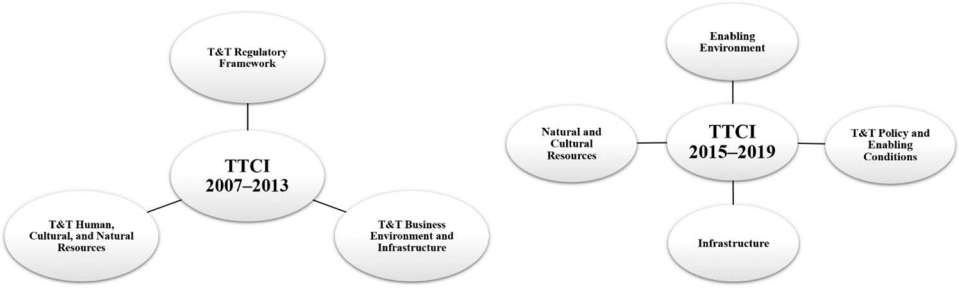

Figure 1. Comparison of the Travel and Tourism Competitiveness Index Frameworks

Source: own processing.

The TTCI has been investigated in various studies, e.g., Croitoru (2011); Wu (2011); Leung, Baloglu (2013); Cîrstea (2014); Assaf, Tsionas (2015); Ivanov, Ivanova (2016); Pulido-Fernández, Rodríguez-Díaz (2016); Dias (2017); Khan et al. (2017); Martín et al. (2017); Radovanov et al. (2020); Vašaničová et al. (2021); Bazargani, Kiliç (2021); Kunst, Ivandić (2021); Perez Leon et al. (2021); Vašaničová et al. (2022); Băbăț et al. (2023); González-Rodríguez et al. (2023); Uyar et al. (2023); Vašaničová et al. (2023).

The Travel and Tourism Development Index (TTDI), directly evolved from the TTCI, was first published in May 2022, covering the year 2021. According to Uppink Calderwood, Soshkin (2022), the TTDI assesses and compares various factors and policies that facilitate the sustainable and resilient growth of the tourism sector, thereby contributing to a country's overall development. TTDI offers businesses, governments, and international organizations a strategic benchmarking tool for advancing the tourism sector. By facilitating cross-country comparisons and assessing nations' progress on tourism development drivers, it guides policies and investment decisions concerning tourism enterprises and the sector overall. The TTDI offers a distinct view of each analyzed country's strengths and areas for improvement. The goal is to assist countries in enhancing the long-term growth of their tourism sector in a sustainable and resilient way. Additionally, it offers a valuable platform for multi-stakeholder discussions to develop suitable policies and actions at local, national, regional, and global levels. The second edition of the TTDI was released in May 2024 and is known as TTDI 2024. The methodology for creating the TTDI has changed in 2024 compared to the original from 2021. The names of each subindex are illustrated in Figure 2.

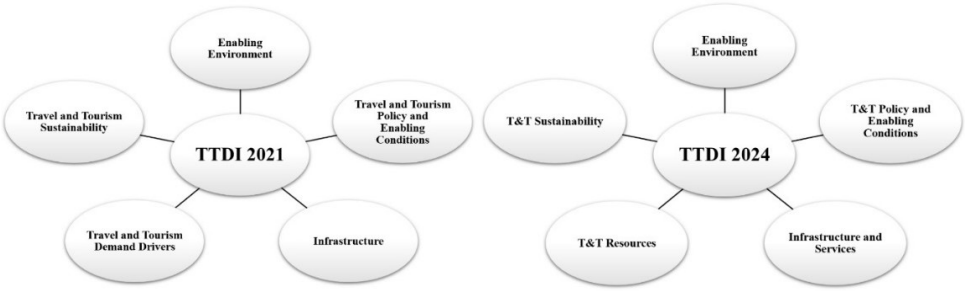

Figure 2. Comparison of the Travel and Tourism Development Index Frameworks

Source: own processing.

The individual subindexes are made up of pillars. Considering TTDI 2021, the individual 17 pillars are as follows: Business Environment, Safety and Security, Health and Hygiene, Human Resources and Labour Market, ICT Readines (subindex Enabling Environment); Prioritization of Travel and Tourism, International Openness, Price Competitiveness (subindex Travel and Tourism Policy and Enabling Conditions); Air Transport Infrastructure, Ground and Port Infrastructure, Tourist Service Infrastructure (subindex Infrastructure); Natural Resources, Cultural Resources, Non-Leisure Resources (subindex Travel and Tourism Demand Drivers); Environmental Sustainability, Socioeconomic Resilence and Conditions, Travel and Tourism Demand Pressure and Impact (subindex Travel and Tourism Sustainability). Considering TTDI 2024, the individual 17 pillars are as follows: Business Environment, Safety and Security, Health and Hygiene, Human Resources and Labour Market, ICT Readines (subindex Enabling

Environment); Prioritization of T&T, Openness to T&T, Price Competitiveness (subindex T&T Policy and Enabling Conditions); Air Transport Infrastructure, Ground and Port Infrastructure, Tourist Services and Infrastructure (subindex Infrastructure and Services); Natural Resources, Cultural Resources, Non-Leisure Resources (subindex T&T Resources); Environmental Sustainability, T&T Socioeconomic Impact, T&T Demand Sustainability (subindex T&T Sustainability). In 2021, 117 countries were assessed; in 2024, 119. In 2024, 5 countries were dropped from the ranking and 7 others were added.

The body of research focusing on the TTDI remains sparse and underdeveloped, indicating a significant gap in scholarly attention and study (e.g., Maulana et al., 2022; Ozkaya, Demirhan, 2022; Hefny, 2023; Dzurov Vargová et al., 2024; Lazarević et al., 2024; Marti, Puertas, 2024; Purwono et al., 2024; Salam, 2024; Vašaničová, Bartók, 2024).

3. METHODOLOGY

This paper aims to identify the degree of agreement between the new and the original calculation methodology in the TTDI values achieved by countries. From this aim, we can formulate the following research hypothesis:

Hypothesis 1: There is a correlation in the TTDI values achieved by countries between the new and the original calculation methodology.

The complementary first objective is to show the values achieved concerning the region in which the country is located and concerning the income group. The second objective is to quantify differences in the country's ranking between the original and new rankings within TTDI.

The secondary data used are available online on the World Economic Forum (2022) and World Economic Forum (2024) websites. Even though the new TTDI methodology was introduced for 2024, the data (values and rankings) for 2019 and 2021 have also been recalculated using this approach. Therefore, we will test our hypothesis for 2019 and 2021. The Spearman correlation coefficient will be used to determine the level of agreement. We use R software for visualization and calculations.

The research sample had to be adjusted because not all countries were analyzed in both years. The 5 countries (Cape Verde, Hong Kong SAR, Lesotho, Chad, Yemen) assessed in 2021 were not assessed in 2024 and, conversely, the 7 countries (Barbados, Algeria, Iran, Jamaica, Oman, Uzbekistan, Zimbabwe) assessed in 2024 were not assessed in 2021. The research sample, in this study, consists of 112 countries, which are further divided into two categories, namely region (Asia-Pacific, Europe and Eurasia, Middle East and North Africa, Sub-Saharan Africa, The Americas) and income group (High, Upper-middle, Lower-middle, Low-income economies). These categories are derived from the database of the World Economic Forum (2024). The lists of countries according to region and income group are in Appendix (Tables A1 and A2). As the research sample has been reduced to 112 countries, we recalculated the country rankings within the TTDI.

4. RESULTS AND DISCUSSION

Figures 3 and 4 visualize scatterplots that point to the relationship between the values of original and new TTDI in 2019 and 2021. Countries (dots) are color-coded by region (Figure 3) and income group (Figure 4). Our aim is to point out that the values of TTDI differ across groups. In all cases, the relationship is positive. Countries with low values of the original TTDI also have low values of the new TTDI and vice versa.

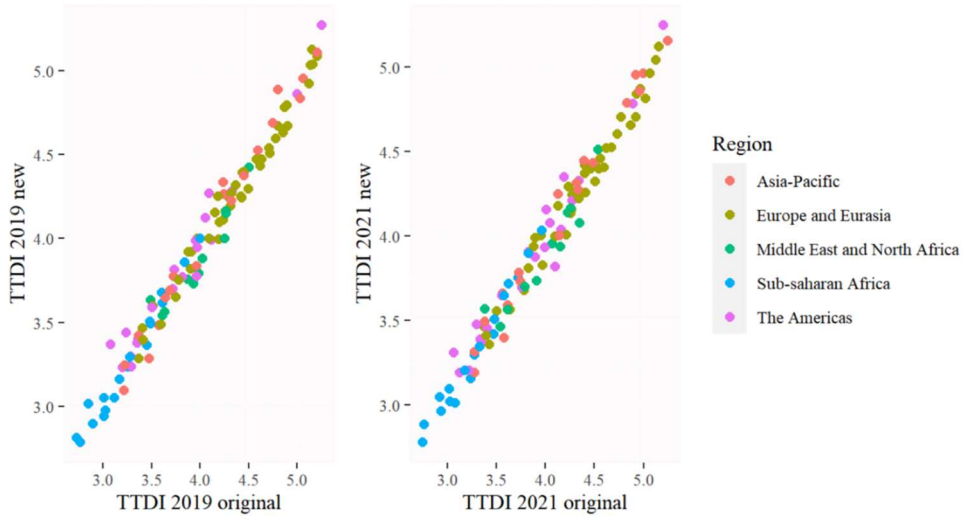

Figure 3. New and original TTDI values by region

Source: own processing using R.

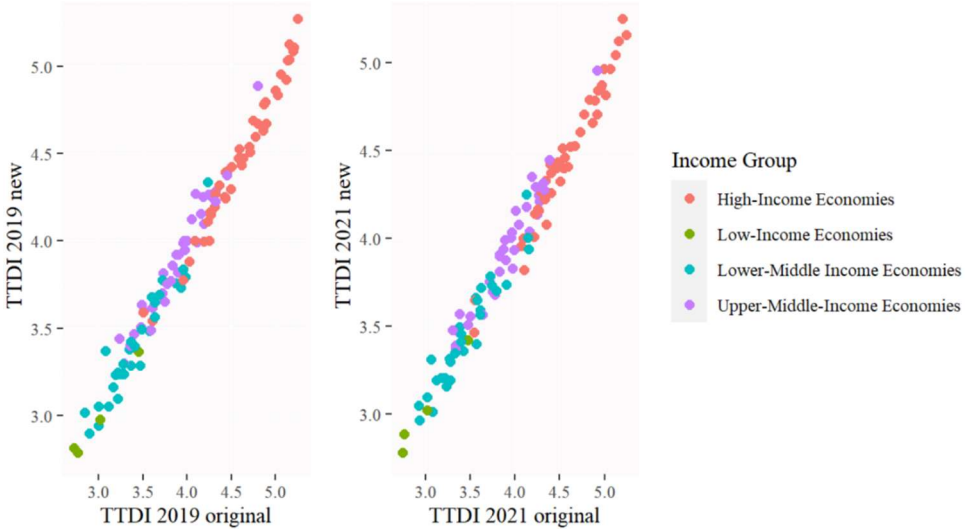

Figure 4. New and original TTDI values by income group

Source: own processing using R.

We see the highest values of TTDI in the Europe and Eurasia and the Asia-Pacific region. The lowest values are in the Sub-Saharan Africa region. The countries of the Middle East and North Africa region and The Americas acquire an intermediate level of TTDI values. According to the income group, we see the highest values of TTDI in the high-income economies and the lowest values in the low-income economies. The second highest values belong to the upper-middle-income economies.

Tables 1 and 2 present descriptive statistics of the TTDI values according to region and income group. The outcomes align with the graphical depiction in Figures 3 and 4.

Table 1. Descriptive statistics of the TTDI values according to region

	Asia-Pacific (19)				Europe and Eurasia (43)			
	2019 original	2019 new	2021 original	2021 new	2019 original	2019 new	2021 original	2021 new
Mean	4.13	4.09	4.15	4.14	4.36	4.27	4.34	4.26
S.D.	0.65	0.64	0.64	0.62	0.51	0.47	0.48	0.44
Min	3.21	3.10	3.27	3.20	3.36	3.29	3.37	3.36
Q1	3.60	3.57	3.59	3.63	4.03	4.00	4.03	4.00
Median	4.23	4.23	4.14	4.25	4.37	4.26	4.34	4.26
Q3	4.67	4.61	4.66	4.62	4.75	4.57	4.64	4.52
Max	5.21	5.11	5.25	5.16	5.20	5.13	5.15	5.12
	Middle East and North Africa (11)				**Sub-Saharan Africa (18)**			
	2019 original	2019 new	2021 original	2021 new	2019 original	2019 new	2021 original	2021 new
Mean	3.98	3.88	3.98	3.89	3.25	3.27	3.29	3.32
S.D.	0.32	0.28	0.37	0.32	0.37	0.36	0.36	0.37
Min	3.49	3.54	3.38	3.47	2.72	2.79	2.75	2.78
Q1	3.75	3.68	3.70	3.64	3.00	2.99	3.02	3.03
Median	3.98	3.79	4.06	3.94	3.20	3.20	3.26	3.25
Q3	4.26	4.08	4.24	4.11	3.48	3.50	3.55	3.61
Max	4.50	4.42	4.53	4.51	4.00	4.00	3.96	4.04
	The Americas (21)							
	2019 original	2019 new	2021 original	2021 new				
Mean	3.84	3.86	3.86	3.88				
S.D.	0.58	0.53	0.56	0.53				
Min	3.07	3.23	3.06	3.19				
Q1	3.35	3.40	3.34	3.46				
Median	3.81	3.78	3.90	3.88				
Q3	4.09	4.13	4.16	4.16				
Max	5.25	5.27	5.20	5.25				

Source: own processing using R.

Taking the medians from the highest values into account, the ranking by region (Table 1) is as follows: Europe and Eurasia region, Asia-Pacific region, Middle East and North Africa region, The Americas, and Sub-Saharan Africa region. In terms of medians according to the income group (Table 2), the order is from high-income economies to low-income economies. Considering the best values of TTDI according to analyzed regions (maximums in Tables 1 and 2), among the best countries are Japan (Asia-Pacific region), United Kingdom and Spain (Europe and Eurasia region), United Arab Emirates (Middle East and North Africa), Mauritius (Sub-Saharan Africa region), and the United States (The Americas region). According to the income groups, among the best countries are the United

States and Japan (high-income), China (upper-middle income), India (lower-middle income), and Rwanda (low-income).

Table 2. Descriptive statistics of the TTDI values according to income group

	High (44)				Low (4)			
	2019 original	2019 new	2021 original	2021 new	2019 original	2019 new	2021 original	2021 new
Mean	4.58	4.47	4.56	4.46	2.99	2.99	3.00	3.03
S.D.	0.42	0.42	0.40	0.40	0.33	0.27	0.34	0.28
Min	3.50	3.54	3.54	3.47	2.72	2.79	2.75	2.78
Q1	4.29	4.19	4.32	4.21	2.75	2.81	2.76	2.86
Median	4.59	4.45	4.53	4.41	2.89	2.90	2.89	2.95
Q3	4.89	4.79	4.90	4.79	3.13	3.08	3.14	3.12
Max	5.25	5.27	5.25	5.25	3.45	3.37	3.47	3.42
	Lower-Middle (30)				**Upper-Middle (34)**			
	2019 original	2019 new	2021 original	2021 new	2019 original	2019 new	2021 original	2021 new
Mean	3.43	3.41	3.46	3.46	3.89	3.91	3.91	3.94
S.D.	0.35	0.32	0.34	0.31	0.36	0.34	0.37	0.35
Min	2.84	2.90	2.92	2.97	3.23	3.30	3.30	3.37
Q1	3.20	3.23	3.22	3.21	3.64	3.64	3.73	3.69
Median	3.36	3.38	3.40	3.41	3.90	3.92	3.93	3.94
Q3	3.63	3.67	3.62	3.69	4.14	4.15	4.18	4.17
Max	4.23	4.34	4.15	4.25	4.80	4.89	4.92	4.96

Source: own processing using R.

Table 3. Hypothesis testing

	All countries (112)		Asia-Pacific (19)		Europe and Eurasia (43)	
	2019	2021	2019	2021	2019	2021
Spearman's rho	0.9884	0.9854	0.9895	0.9807	0.9858	0.9829
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Middle East and North Africa (11)		**Sub-Saharan Africa (18)**		**The Americas (21)**	
	2019	2021	2019	2021	2019	2021
Spearman's rho	0.9636	0.9364	0.9711	0.9732	0.9597	0.9545
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	High (44)		**Upper-Middle (34)**		**Lower-Middle (30)**	
	2019	2021	2019	2021	2019	2021
Spearman's rho	0.9908	0.9780	0.9731	0.9624	0.9524	0.9533
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: own processing using R.

The differences between the descriptive statistics in 2019 and 2021 using the new and original methodologies are minimal. Table 3 presents the results of testing the research hypothesis using Spearman's correlation coefficient. The agreement in the achieved TTDI values between the new and the original methodology is statistically significant at the 0.001

significance level. Spearman's correlation coefficients are close to 1, and thus, the agreements can be considered very high. Coefficients are calculated for the sample of all analyzed countries and individual groups by region and income group (except for low-income economies due to the small sample size).

The results show that despite the changed methodology for calculating the TTDI, the values achieved by the countries are highly correlated.

Table 4 shows differences in the country's ranking between the original and new rankings within TTDI. A higher drop is indicated by a deeper red color, and a higher growth is indicated by a deeper green color. The highest drop is recorded for Saudi Arabia (from 32nd to 50th place in 2021), Uruguay (from 54th to 67th place in 2021), and Pakistan (from 81st to 93rd place in 2021). On the other hand, the highest increase is recorded for Brazil (from 48th to 30th place in 2021), India (from 45th to 29th place in 2019 and from 53rd to 38th place in 2021), and Argentina (from 58th to 45th place in 2021).

Table 4. Differences in countries' rankings between the original and new rankings within TTDI

	Δ original – new			Δ original – new			Δ original – new			Δ original – new	
Country	**2019**	**2021**	**Country**	**2019**	**2021**	**Country**	**2019**	**2021**	**Country**	**2019**	**2021**
AGO	3	3	EGY	-9	-10	KOR	4	3	PHL	6	5
ALB	-5	-5	ESP	3	0	KWT	-4	-4	POL	2	0
ARE	0	4	EST	-10	-9	LAO	3	5	PRT	0	1
ARG	6	13	FIN	-1	0	LBN	8	11	PRY	11	10
ARM	1	-6	FRA	0	0	LKA	1	1	QAT	-6	-2
AUS	1	1	GBR	-1	0	LTU	-4	-5	ROU	4	9
AUT	-4	-3	GEO	-3	-6	LUX	-2	-5	RWA	-6	-4
AZE	7	7	GHA	-3	-1	LVA	-7	-7	SAU	-8	-18
BEL	1	0	GRC	1	0	MAR	-3	-4	SEN	0	2
BEN	-1	-4	GTM	3	1	MDA	-5	-6	SGP	-2	0
BGD	-3	-5	HND	0	0	MEX	1	-3	SLE	1	0
BGR	-1	1	HRV	-3	-2	MKD	3	1	SLV	1	-1
BHR	-6	-3	HUN	-6	-4	MLI	-1	0	SRB	-1	1
BIH	3	4	CHE	-1	-5	MLT	-7	-7	SVK	0	-2
BOL	2	-1	CHL	2	2	MNE	4	5	SVN	2	2
BRA	17	18	CHN	6	5	MNG	-1	5	SWE	1	0
BWA	-1	5	IDN	7	9	MUS	2	8	THA	-7	0
CAN	0	0	IND	16	15	MWI	-2	-1	TJK	-2	-2
CIV	-2	-4	IRL	-2	-3	MYS	0	4	TTO	3	5
CMR	-1	-1	ISL	-1	-6	NAM	3	1	TUN	-5	-4
COL	5	6	ISR	-4	-2	NGA	2	2	TUR	11	10
CRI	-5	-3	ITA	0	0	NIC	-5	0	TZA	0	1
CYP	2	6	JOR	-9	-8	NLD	-3	-2	URY	-7	-13
CZE	-5	-7	JPN	-1	-1	NPL	1	2	USA	0	1
DEU	-1	0	KAZ	7	7	NZL	3	3	VEN	12	7
DNK	0	0	KEN	5	4	PAK	-11	-12	VNM	-3	-5
DOM	7	5	KGZ	-6	-8	PAN	0	-3	ZAF	6	3
ECU	1	-3	KHM	-5	-2	PER	0	-1	ZMB	1	-1

Note: countries' codes are according to Alpha-3.

Source: own calculations.

5. CONCLUSION

The evolution in TTDI methodology ensures that the TTDI remains a robust tool for assessing and guiding tourism development policies globally. The results reveal that, despite the alterations in the TTDI calculation methodology, the values obtained by the countries remain highly correlated. The highest TTDI values are observed in Europe, Eurasia, and the Asia-Pacific region, while the lowest values are found in Sub-Saharan Africa. Countries in the Middle East and North Africa, as well as the Americas, display intermediate TTDI levels. When categorized by income group, high-income economies report the highest TTDI values, whereas low-income economies show the lowest. Upper-middle-income economies have the second-highest TTDI values.

Regular monitoring of tourism development indicators allows for the evaluation of existing policies and initiatives. By understanding key indicators, policymakers can make data-driven decisions that optimize tourism benefits and address challenges. This ensures that development strategies promote sustainability and prevent the depletion of natural resources, cultural degradation, and other negative consequences. Identifying and analyzing potential risks allows for the development of strategies to mitigate these risks. This ensures the resilience and long-term viability of the tourism sector. Moreover, comprehensive data on tourism development fosters transparency and collaboration among stakeholders, including government agencies, private sector players, and local communities.

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APPENDIX A

Table A1. Countries according to region

Asia-Pacific		Europe and Eurasia				Middle East and North Africa	Sub-Saharan Africa		The Americas	
AUS	MNG	ALB	ESP	ISL	NLD	ARE	AGO	MWI	ARG	MEX
BGD	MYS	ARM	EST	ITA	POL	BHR	BEN	NAM	BOL	NIC
CHN	NPL	AUT	FIN	KAZ	PRT	EGY	BWA	NGA	BRA	PAN
IDN	NZL	AZE	FRA	KGZ	ROU	ISR	CIV	RWA	CAN	PER
IND	PAK	BEL	GBR	LTU	SRB	JOR	CMR	SEN	COL	PRY
JPN	PHL	BGR	GEO	LUX	SVK	KWT	GHA	SLE	CRI	SLV
KHM	SGP	BIH	GRC	LVA	SVN	LBN	KEN	TZA	DOM	TTO
KOR	THA	CYP	HRV	MDA	SWE	MAR	MLI	ZAF	ECU	URY
LAO	VNM	CZE	HUN	MKD	TJK	QAT	MUS	ZMB	GTM	USA
LKA		DEU	CHE	MLT	TUR	SAU			HND	VEN
		DNK	IRL	MNE		TUN			CHL	

Note: countries' codes are according to Alpha-3.

Source: own processing.

Table A2. Countries according to income group

High				Upper-middle			Lower-middle			Low
ARE	EST	ISR	POL	ALB	GEO	MYS	AGO	JOR	NPL	MLI
AUS	FIN	ITA	PRT	ARG	GTM	NAM	BEN	KEN	PAK	MWI
AUT	FRA	JPN	QAT	ARM	CHN	PAN	BGD	KGZ	PHL	RWA
BEL	GBR	KOR	SAU	AZE	IDN	PER	BOL	KHM	SEN	SLE
BHR	GRC	KWT	SGP	BGR	KAZ	PRY	CIV	LAO	TJK	
CAN	HRV	LTU	SVK	BIH	LBN	ROU	CMR	LKA	TUN	
CYP	HUN	LUX	SVN	BRA	MDA	SLV	EGY	MAR	TZA	
CZE	CHE	LVA	SWE	BWA	MEX	SRB	GHA	MNG	VEN	
DEU	CHL	MLT	TTO	COL	MKD	THA	HND	NGA	VNM	
DNK	IRL	NLD	URY	CRI	MNE	TUR	IND	NIC	ZMB	
ESP	ISL	NZL	USA	DOM	MUS	ZAF				
				ECU						

Note: countries' codes are according to Alpha-3.

Source: own processing.