Etikonomi
Volume 20 (2), 2021: 385 - 396
P-ISSN: 1412-8969; E-ISSN: 2461-0771

The Impacts of Tourism and Governance on CO_2 Emissions in Selected South Asian Countries

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JEL Classification:
Q50
Q56
Q58

Received: 22 September 2020

Revised: 13 January 2021

Accepted: 27 January 2021

Abstract

Due to the increase in international connectivity and technological advancement, tourism has gained immense momentum in the recent past. Despite its favorable impacts, tourism has proved to be one of the significant contributors to increasing CO2 emissions. This study attempts to understand better the relationship between tourism, governance, and the CO2 emissions nexus in selected South Asian countries. The study obtained data from WDI and applied FMOLS, DOLS, and FEOLS methods from 1995-2019. It is observed that tourism has a significant and positive impact on CO2 emissions in the case of selected South Asian countries. Concerning the impact of governance on CO2 emissions, it is observed that governance effectiveness is negatively associated with CO2 emissions. It is evident from the empirical analysis that CO2 emissions can be mitigated with effective government policies. Furthermore, it is also suggested that the government aim at effective environmental policies, and attention should be given to sustainable tourism in the case of South Asian economies.

Keywords:
tourism, governance, South Asian countries

How to Cite:

Andlib, Z., & Salcedo-Castro, J. (2021). The Impacts of Tourism and Governance on CO_2 Emissions in Selected South Asian Countries. *Etikonomi, 20*(2), 385 – 396. https://doi.org/10.15408/etk.v20i2.17499.

Introduction

The tourism sector plays a pivotal role in economic growth due to its multiplier effects on the economy. It tends to create a substantial increase in the gross domestic product (GDP) (Shahzad et al., 2017). At the same time, it helps to create new employment opportunities directly and indirectly and generate and increase revenues (Dogan & Aslan, 2017; Mathew & Sreejesh, 2017; Yaşar et al., 2019). According to the United Nations World Tourism Organization (UNWTO) 2019, the tourism sector accounts for ten percent of world GDP and also helps to create one in ten jobs in the developed and developing world. There is a strong association between tourism and sustainable development goals agenda 2030.

The tourism sector has immense potential to contribute to SDGs 8, 12, and 14 as it has also been included in the targets of the goals mentioned above (Siakwah et al., 2020; Ristić et al., 2019). It was estimated by UNWTO (2019) that the tourism sector grew at a rate of 4 percent in 2019. Almost all the regions in the world have seen an increase in tourism activities, such as the Middle East (8 percent), Asia and Pacific (5 percent), and Europe and Africa (4 percent), whereas America is lagging at the growth rate of 2 percent only. According to UNWTO's (2019) forecast, world tourism will grow at the rate of 3 to 4 percent in 2020.

International tourist arrivals increased from 770 million in 2005 to 1.2 billion in 2016 and are forecasted to reach 1.8 billion in 2030. Domestic tourist arrivals have doubled from 4 billion in 2005 to 8 billion in 2016 and are projected to reach 15.6 billion in 2030 (WTO 2011, WTO 2018). Affordable air travel, increased connectivity, new technological advances, new business models, and more excellent visa facilitation around the world have fostered the continuous growth of international and domestic tourism in the past decades (Anson & Avin, 2016; Dogan et al., 2017; Roudi et al., 2019). While this evolution offers vast opportunities, it also has significant responsibilities, notably concerning environmental impacts and climate change (Eyuboglu & Uzar, 2020). The negative impacts of tourism increasingly concern governments worldwide, and many are striving to reduce tourism's carbon footprint. Efficiency improvements have reduced emissions per passenger, but the number of tourists outweighs these improvements.

The decarbonization of the transport sector will have to be an essential part of the solution (Liu et al., 2019; Balli et al., 2019). In 2016, CO_2 emissions from transport, including passenger (car, rail, air) and freight (maritime, air, surface) transport, were estimated to total 7,230 million tonnes globally, representing 23% of all manufactured CO_2 emissions. Out of the total transport emissions, 64% or 4,650 million tonnes of CO_2 were produced by passenger transport. Emissions from passenger transport are calculated to have split almost equally between non-urban and urban transport. In terms of transport volumes, the estimates show that 44,000 billion PKM were traveled in 2016, 60% of which correspond to non-urban transport (IFT, 2019).

According to forecasts from ITF (2019) for 2030, despite expected increases in fuel efficiency and the emergence of cleaner and greener modes of transport, growth in

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DOI: htttp://doi.org/10.15408/etk.v20i2.17449

passenger and freight transport demand will lead to higher CO_2 emissions. By 2030, total passenger and freight transport-related CO_2 emissions are estimated to grow by 21% compared to 2016 and reach 8,772 million tonnes of CO_2, representing 23% of all manufactured CO_2 emissions. Passenger transport-related demand is projected to increase by 69% by 2030, reaching 75,000 billion PKM, two-thirds of which will be done in a non-urban setting. In the recent past, we have observed that institutional failure and poor governance lead to too many environmental problems, including increased CO_2 emissions (Lameira et al., 2016; Tarverdimamaghani, 2017; Jebli et al., 2019; Asongu & Odhiambo, 2020). Therefore countries with effective policies tend to manage their environment better. Generally, environmental policies depend on governmental policies. In turn, governmental policies are dependent on the structure and effectiveness of the government.

Previous literature also highlights that environmental degradation often stems from institutional failures. To measure governance effectiveness and quality, the Worldwide Governance Indicators (WGI) documented six different indicators such as voice and accountability, political stability and absence of violence (democracy), government effectiveness, and regulatory quality, rules of law, and control of corruption (Tarverdi, 2018). As a result of increasing threats of global warming and climate change, there is a particular need to discuss global environmental issues with a special focus on governance effectiveness. As we have mentioned that governance comprises six different indicators, the literature also noted that every governance index is differently connected with CO_2 emissions. It is observed that institutional quality is one of the significant determinants of environmental quality (Halkos & Tzeremes, 2013).

Meanwhile, corruption also impacts environmental quality in two ways, either directly or indirectly. As corruption affects institutional performance and creates rent-seeking behavior, it often creates obstacles to the effective implementation of environmental quality regulations. Therefore it is observed from different studies that control of corruption is mandatory for implementing environmental laws.

We found vast literature on the issue of tourism and CO_2 emissions for an individual country as well as for the group of countries, for example, Akan et al., 2008; Lee & Brahmasrene, 2013; Al-Mulali et al., 2015; Dogan & Aslan, 2017; I$\S$ik & Radulescu, 2017; Chen et al., 2018; Jebli et al., 2019 and Li et al., 2019. Most of these studies found a positive impact of tourism activities on CO_2 emissions. Also, the existing literature supports the negative impact of good governance on CO_2 emissions (Samimi et al.,2012; Gani, 2012; Halkos & Tzeremes, 2013; Halkos et al., 2015; Haseeb et al., 2018; Danish et al., 2019; Muhammad et al., 2019).

The basic idea of this study is to emphasize the issue of sustainable tourism by focusing on the role of governance in regulating the tourism sector emissions. The study's specific objectives are to evaluate the impact of tourism arrivals on CO_2 emissions in selected South Asian countries and analyze the impact of governance effectiveness on CO_2 emissions in selected South Asian countries. Also, the study attempt to assess the

combined effect of governance effectiveness and tourism sector activities on CO_2 emissions for the selected countries.

Most of the existing literature found the relationship between tourism and CO_2 emissions in developed countries and top tourist destinations. There are very few studies that incorporate the composite role of governance effective and tourism sector activities in mitigating the CO_2 emissions for the South Asian countries. The present study attempts to cover the literature gap by incorporating the interaction term of governance effectiveness and tourism arrivals, i.e., a proxy for the tourism sector activities in South Asian countries.

Moreover, the study contributes to the existing literature in various ways. It assesses the impact of tourism and governance on CO_2 emission for the panel of selected South Asian countries. Besides, in the existing literature in energy and environmental economics, the role of governance to curtail tourism sector emissions is not given much importance. Therefore, the present study also incorporates the combined effect of governance effectiveness and tourism sector activities to mitigate CO_2 emissions. The study also utilizes the latest econometrics techniques to assess the said relationship. Besides, the study provides suitable policies for South Asian countries, which may be generalized for a similar group of countries. The rest of the study is structured in the following manner. Section 2 presents methods. After that, we discuss results, and at the end, we conclude the study and proposed policies based on our empirical results.

Methods

In this study, we intend to analyze the impact of tourist arrivals as a proxy for the tourism sector activities and governance effectiveness and their composite impact on CO_2 emissions. The description of the variables is presented in Table 1. The period of the analysis is from 1996 to 2019. Our selected South Asian countries include Pakistan, India, Sri Lanka, and Bangladesh. We have extracted the data from World Development Indicators, the official data bank of the World Bank.

Table 1. Description of the selected variables

Variable	Symbol	Definition	Source
Corban emissions	CO_2	Carbon dioxide emissions (kilotons).	WDI
Tourism	Tur	The number of international tourist arrivals.	WDI
Governance effectiveness	GE	The quality of governance, including the quality of public services.	WGI
Energy consumption	EC	Kg of oil equivalent energy use.	WDI
Gross domestic product	GDP	Real GDP.	WDI

By following Katircioglu (2014) and Haseeb et al. (2018) the general form of the model is:

$$CO_2 = f\ (Tur,\ GE, EC,\ GDP) \quad (1)$$

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By transforming it into natural logarithm the model will take the following form.

$$\ln CO_{2it} = \alpha_0 + \alpha_1 \ln Tur_{it} + \alpha_2 GE_{it} + \alpha_3 \ln EC_{it} + \alpha_4 \ln GDP_{it} + \varepsilon_{it} \quad (2)$$

$$\ln CO_{2it} = \alpha_0 + \alpha_1 lnTurGE_{it} + \alpha_2 \ln EC_{it} + \alpha_3 \ln GDP_{it} + \varepsilon_{it} \quad (3)$$

In equation 1, we have the general form of the model to assess the impact of governance effectiveness and tourism on CO_2 emissions. In equation 2, we assess the impact of tourism and governance effectiveness on environmental quality indicated by CO_2 emissions for the selected panel of South Asian countries. In equation 3, we introduced an interaction term to see the collective impact of governance effectiveness and tourism arrivals on CO_2 emissions. Here we want to assess the role of governance effectiveness along with tourism to reduce CO_2 emissions.

After the model's specification, we will apply the panel unit root tests to find out the order of integration and the panel data stationarity. We can check the stationarity of data through LLC and IPS tests. LLC stands for Levin, Lin, and the Chu, and IPS stands for Im, Pesaran, and Shin. After checking the stationarity of the data, we concluded that all of the variables are integrated into order 1. To produce the long-run estimates, several econometrics techniques are available in the literature. However, the present study utilizes fully modified ordinary least square (OLS) and dynamic OLS. Pedroni used the fully modified ordinary least square (FMOLS) to solve the problem of endogeneity and the serial correlation between the regressors. Besides, the DOLS method was proposed by Stock & Watson (1993), and later on, it was extended by Kao (1999). The DOLS method is also helpful in correcting the problem of endogeneity. For the comparison of the empirical results, we used FEOLS.

Table 2. Panel Unit Root Tests

Variables		With Intercept		With Trend & Intercept	
		Statistic	P-Values	Statistic	P-Values
		First difference			
CO_2	LLC	-2.852	0.000	-5.102	0.0003
	IPS	-5.124	0.000	-2.985	0.002
Tur	LLC	-4.801	0.000	-2.921	0.053
	IPS	-5.255	0.000	-6.881	0.002
GE	LLC	-4.110	0.000	-6.211	0.000
	IPS	-8.555	0.000	-6.811	0.001
EC	LLC	-6.421	0.000	-3.401	0.000
	IPS	-5.962	0.000	-3.721	0.000
GDP	LLC	-3.990	0.000	-4.640	0.0001
	IPS	-2.002	0.000	-2.652	0.003

Results and Discussion

In this section, we will discuss the empirical results of the model. Table 3 presents the descriptive statistics of the selected variables. The mean value of CO_2 is 4.511, and the mean value of the variable tourism is 5.651. Moreover, the mean value of governance effectiveness is 0.616, the mean value of energy consumption is 2.851, and the mean value of GDP is 10.776. Since our variables are integrated of order I, we applied at least one cointegration test to confirm the existence of long-run relationships among the selected variables. The study used two panel cointegration tests: the Pedroni panel cointegration test (Pedroni, 1999; 2004) and the Kao panel cointegration test (Kao, 1999). The reported results in Table 4 confirmed the existence of cointegration among selected variables at 1 percent.

In Table 5, the estimation results express the value of each coefficient and its probability values. Here, the dependent variable is CO_2 emissions. In model 1, the coefficient value of tourism shows that if tourism increases by one percent, then the CO_2 emissions will increase by 0.21% for the selected countries in the South Asian block. The result is found consistent with other authors (Ozturk, 2016; Katircioglu, 2014; Shakouri et al., 2017; Paramati et al., 2018; Danish & Wang, 2018), and not consistent with Dogan & Aslan (2017), as these authors conclude that tourism tends to mitigate CO_2 emissions. The coefficients of governance effectiveness show a negative relationship with CO_2 emissions. Therefore we can conclude that governance effectiveness is negatively associated with CO_2 emission in the selected South Asia countries.

Table 3. Descriptive Statistics

Variables	CO_2	Tur	GE	EC	GDP
Mean	4.511	5.651	0.616	2.851	10.776
Median	4.712	5.565	0.624	2.703	10 .721
Maximum	6.021	7.091	1.283	2.163	12.441
Minimum	3.412	5.001	0.088	2.096	9.551
Std. Dev.	0.699	0.466	0.321	0.851	0.708

Our results are supported by various studies from the literature on governance and CO_2 nexus for different countries around the globe (Halkos & Tzeremes, 2013; Halkos et al., 2013; Yang et al., 2018; Haseeb et al., 2018; Asongu & Odhiambo, 2020). The coefficient of the log of energy consumption shows that if energy consumption increases by one percent, then CO_2 emissions will increase by 0.41%.

The result is similar to Lee & Brahmasrene, 2013; Khobai & Le Roux, 2017; Dogan & Aslan, 2017; Wang & Fang, 2018; Muhammad, 2019; Mensah et al., 2019; Munir et al., 2020. The coefficient of the GDP shows that if GDP increases by one percent, then CO_2 emissions will increase by 1.10%. Our results are supported by the

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DOI: htttp://doi.org/10.15408/etk.v20i2.17449

previous and recent literature; for example, Magazzino, 2016; Bekhet & Othman, 2018; Magazzino & Cerulli, 2019; Balli et al., 2019; Beşe & Kalayci, 2021; Munir et al., 2020. The coefficient of the interaction term of governance and tourism shows that governance effectiveness and tourism will help to decrease CO_2 emissions by 0.16%. Almost similar results are found for the other two models, i.e., DOLS and FEOLS. It also concludes that policymakers should emphasize the support of low carbon tourism development. Significantly more attention should be given to energy intensity reduction from tourism. The empirical results also support this notion that effective governance policies concerning tourism development also helps to reduce CO_2 emissions in selected South Asia countries.

Table 4. Pedroni Cointegration Test

Common AR coefs. within dimension				
	Stat.	**Prob.**	**Weight Stat.**	**Prob.**
V-statistics	10.25	0.00	6.23	0.314
Rho-statistics	3.22	0.210	3.11	0.307
PP-statistics	-3.11	0.001	-3.11	0.001
ADF-statistics	-7.13	0.001	6.00	0.001
Individual AR coefs. between-dimension				
Rho-statistics	4.99	0.560		
PP-statistics	2.19	0.000		
ADF-statistics	-9.11	0.001		
Kao's cointegration test				
	t-statsitics	Probability		
ADF	-3.660	0.000		

Table 5. Panel Long Run estimators

Variables	**FMOLS**		**DOLS**		**FE OLS**	
Tur	0.21** (0.02)	-	0.02*** (0.00)	-	0.01*** (0.00)	-
GE	-0.18***	-	-0.15**	-	-0.18**	-
TurGE	-	-0.17*** (0.00)	-	-0.16*** (0.00)	-	-0.19*** (0.00)
EC	0.41*** (0.00)	0.19*** (0.00)	0.05*** (0.00)	0.34*** (0.00)	0.29*** (0.05)	0.14*** (0.00)
GDP	1.10*** (0.00)	1.02** (0.03)	0.21*** (0.00)	0.10*** (0.00)	0.68*** (0.00)	0.41** (0.03)

***, **, * represent 1, 5 & 10 percent level of significance. In parenthesis ( ) are probabilities.

Conclusions

As for the empirical results of selected South Asia countries, the present study illustrates the role of governance in controlling the environmental degradation originating from tourism sector activities in selected South Asian countries. This study contributes

to increasing our understanding of tourism-governance and CO_2 nexus in South Asian countries. Following the results, we found that tourism significantly impacts CO_2 emissions, whereas governance quality is negatively associated with CO_2 emissions. We also included an interaction term where we assessed the joint association of tourism and governance effectiveness with CO_2 emissions in the selected countries, and as expected, it is negatively associated with CO_2 emissions. Moreover, CO_2 emissions are also significantly associated with GDP. CO_2 emissions tend to increase as a result of higher energy usage.

It is essential to give more attention to effective government policies that control environmental degradation originating from tourism sector activities in these countries. The government should restrict the amount of carbon that polluters are permitted to emit from the tourism sector. Moreover, attention should be given to sustainable tourism. Sustainable tourism is an industry dedicated to making a low impact on the environment and local culture while helping to generate future employment for local people. The main aim of sustainable tourism is to maximize benefits while safeguarding cultural heritage and minimizing the negative environmental impact of tourism. Sustainable tourism is firmly positioned in the 2030 Agenda. However, achieving this agenda requires a clear implementation framework, adequate financing, and investment in technology, infrastructure, and human resources.

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