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RESEARCH ARTICLE **Open Access**

SYNERGIES AND CONFLICTS BETWEEN INTERNATIONAL TRADE, TOURISM, AND CLIMATE CHANGE MITIGATION IN CHINA

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Abstract
The study aims to establish the correlation between international trade, the tourist sector, foreign direct investments, GDP growth, and climatic changes in China. The study has conducted an analysis of the data spanning from 1995 to 2023, utilizing FMOLS and DOLS models to investigate the enduring correlation between international trade, foreign direct investment, and climate change. The co-integration analysis indicates a favorable association between international trade, foreign direct investment (FDI), and GDP growth. Nevertheless, the rise in global trade and the expansion of GDP has adverse effects on climate change. The study investigated the significant impact of the tourist sector on climate change, particularly in China, where it has a predominantly negative effect. The Chinese government is under pressure to promote the use of renewable energy sources in order to mitigate the climatic impacts of international trade and foreign direct investment. Additionally, they should enhance their tourist industry regulations to minimize pollution generated by the transportation sector.

Keywords International trade, FDI, tourism industry, climate changes, GMM and FMOLS models, China.

INTRODUCTION

A composition opening is still obvious when using cutting-edge evaluation techniques on various geographic locations, but it's crucial to take into account the obscure relationship between human money-related activities and ongoing debasement. Regardless, the correlations between the transportation industry and the rising emissions of CO2 are not compelling. Furthermore, Qi et al. (2020) focused on the relationship between China's GDP and the country's rising CO2 emissions. Reduced byproducts from fossil fuels should be associated with increased financial returns, according to the experts. They arrived at this conclusion by using cointegration and split mix methodologies. Mahrinasari et al. (2019) found a correlation between the growing byproducts of fossil fuels and the movement of exchange between Asian countries. Katircioglu et al. (2020) have demonstrated that a major source of side-effects from petroleum products is China's transportation sector. According to Tugcu and Topcu,(2020) carbon flood has an effect on the development business in the evaluation test economies. For example, Sadorsky (2009) examined the relationship between the use of practical energy resources and the financial turn of events and discovered that the use of such resources supports an increase in yield. There are several factors that contribute to a section's reputation, but the most fundamental ones are natural degradation, excessive energy usage, and abundant water consumption (Ciacci et al. 2021). Whatever your stance, the data reveals a decline in the number of people in developed countries who feel compelled to express their opinions (Yousaf, 2020). To focus on the impact of economic energy and direct hypotheses on fossil fuel byproducts in China, as well as international trade and the links with the tourism industry. Fossil fuel byproducts have had a significant impact on the transportation industry, international trade, and financial growth since the 1980s. The study provides important insights into the role of various money-related activities in CO2 emissions, increasing the likelihood that the impact of various monetary components on natural contamination will be understood. Furthermore, a similar approach used in the center enables us to identify the differences in natural change support strategies between developed and developing countries. According to Yu and Xu (2019), foreign direct investment (FDI) had a major role in China's reduced CO2 emissions at the national level. In order to illustrate ecological change, the CO2 emissions from the moving company have been assessed using a variety of financial models (Balsalobre, et al. 2020). Generally speaking, the econometric models focused on the direct relationship between the growth of the mobility industry and environmental change (Agbanike et al. 2019). The likelihood that ecological change, particularly in widely dispersed sections, would significantly impact the tourism industry's long- and medium-term prospects is growing (Lemieuxa, 2010). Recently, there has been an increase in research on the financial and environmental implications of movement industry workouts (Croes and partners, 2021). Healthy people are also concerned about the development of an acceptable ITO (Usman et al., 2020).

Here's a breakdown of what's remaining: Section 2 has a special writing survey. Section 3 shows the system and data, while Section 4 shows the outcomes and conversations. Finally, Section 5 offers suggestions for the future as it wraps off this review.

LITERATURE REVIEW

Improve the international trade's impact on the environment and visitors' experience via guidance planning and eliminate the raw lead of environmental destruction (Jing Zhao, 2018). Our ecological effect variables, such as renewable electricity and transportation, farming, officer administration, and fisheries, and GDP growth, affect global tourism (Khan, 2021). According to Meo et al. (2020), the international trade has become one of the fastest-growing industries in the world, creating many jobs, raising global wages, stopping expansion, and causing establishment growth. The tourism industry has positive and friendly impact on environmental structure of developed country because of renewal energy sources (Lasisi et al. 2020). According to development of international trade the tourism industry also grows and both have strong relationship with income growth (Okumus & Erdogan 2021). Tourism sector environmental progress depends heavily on financial indicators (Lasisi et al. 2020). The international trade is a major energy consumer, so understanding the relationships between the economy, environment, energy, and the international trade is crucial to fostering a financially viable tourism industry. To reduce GHG emissions, renewable energy sources like wind and solar are being used worldwide (An et al. 2021). Li et al. (2021) estimates financial improvement by measuring sightseers' and merchants' commitments, expenditures, and obligations, especially foreigners. GDP growth encourages outbound tourism. Sarpong et al. (2020) polled eight South African countries' daily solace assumptions after 20 years. Nguyen and Su (2021) and Gössling et al. (2012) recommend travelers pay extra for concerns bear. Sustainable electricity made tourism more reasonable despite vacationer complaints ethical tourisms pay more (Nguyen et al. 2020). Four of the above economic sectors are directly affected by the tourism industry (Buckley 2011). The sustainability of the tourism industry can be achieved by improving the industry and tourism system to balance all four perspectives, which sightseers now consider essential for their objective and extreme fulfilment decisions (Sharpley, 2000). For the tourism industry's financial line, fossil fuel waste is the biggest issue to safeguard the climate and ecology (Nguyen and Su 2021). Future tourism sector problems include reducing CO2 emissions drastically to avert environmental damage (Peeters and Dubois 2010). Energy access and use determine financial consequences (Udi et al., 2020), therefore governments without enough energy confront apparent financial challenges. According to Isk et al. (2019) tourism industry is now considered as tourism sector energy nexus research is rare and connected to many activities, including transportation, unlike tourism industry development nexus research. Several observational studies have found that the two industries are connected because to tourisms' energy, water, and waste concerns (Dwyer et al. 2010). Solarin (2014) examines Malaysia's tourism and energy usage. A secondary investigation found that tourism industry energy use increases CO2 emissions from movement and transportation. Tourism and CO2 emissions (Koçak et al., 2020). Another driver of ecological incapacity is tourism industry land use. Eco-friendly tourism includes green transportation, technology, and renewable energy efficiency (Paramati et al. 2017). Tourism's sustainability is threatened by high water, energy, and ecological degradation (Skillet et al. 2018). The tourism industry is increasing pollution and CO2 emissions (2019). Tourism and tourism utilize a lot of energy for transportation, convenience, and education (Tsagarakis 2011). Eluwole et al. (2019) showed a non-critical relationship between tourism and ecological maintainability in 10 polluted emissions nations, but other research identified a substantial link between tourism and toxin emissions (LASI et al. 2020). Zhang and Zhang (2020) analyze China's tourist industry and fossil fuels to uncover a correlation. Tourism reduced eastern China's CO2 emissions. However, central and western China's CO2 emissions are essentially unaffected (Zhang and Gao, 2016)). According to Tang et al. (2017), the transport industry uses a lot of energy and emits ozone-damaging chemicals, and it relates the tourism sector size to fossil fuel waste. Zhang and Gao (2016) argue that China's tourism sector is a leading carbon generator due to worldwide development. Tian and colleagues (2020) utilize CO2 emissions levels to estimate GDP growth and sustainable energy consumption in the tourism sector and climate as indicators of ecological quality, and many factors affect tourism, some of which are connected. Calderón-Vargas et al. (2019) examine the possibilities for breeze/sun-based energy based on the spatial-worldly traveler stream in another sustained tourism industry investigation. According to Dogru et al. (2020) that tourism industry improvements have a negative impact on CO2 emissions in Turkey and Canada but a likely impact on emissions from Italy, Slovakia, and Luxembourg. According to Butowski (2021), the tourism industry provides a strong interest in keeping the transportation business profitability. Khan et al. (2019) is also studying Coronavirus, which has devastated the tourism industry for two years, because coronavirus affects tourism in different Spanish locations. According to Moreno et al. (2021) Spanish tourism is vital, but the Coronavirus epidemic has devastated it. Calderón, et al. (2019) study how wind energy projects and tourists affect Amazon neighborhood progress, and Its biodiversity makes it great for tourists. Skillet et al. (2018) think a sustainable tourism sector requires green energy, advances, and transportation. Hafeez et al. (2020) found a crucial correlation between CO2 emissions and globalization in South Asian nations using 40 years of data and causality between development and CO2 emissions. Paramati et al. (2017) found that upgrading the tourism industry causes short-term CO2 emissions but long-term benefits. Lopez and Bhaktikul (2018) found that Thailand's tourist economy relies on simple mountain ascents, historical sites, and sanctuaries. Integrated administration, healthy living, and green tourism should be prioritized. Finally, there should be no assumption that tourism is unconnected to growth (Razzaq et al. 2021). Asadzadeh (2017) discovered a positive association between financial transformation and tourism industry growth. Increased financial resources spur innovation, which can reinvent natural boundaries. Tourism has a major influence on the economy, and Rembeci (2016) suggests studying how economics, climate, and energy affect the tourism business. The next year (Abdouli M, 2020), the GMM assessor was used to examine the relationship between financial development, FDI, ecological quality, and financial advancement. It discovered that FDI drives financial development but degrades the climate. (Abdouli M, 2020). SSA nations have seen moderate growth in foreign direct investment (FDI), although global organizations' new initiatives rely on the host nation's agriculture, assembly, and oil production (Adegboye et al., 2020). It also considers tourism, urbanization, and population increase (Shahzad et al., 2021). Jiang and Mama (2019) discovered that rising fossil fuel waste costs are good. FMOLS assessors use parametric evaluation to address sequential linkage and endogeneity and examine the long-term effects of the chosen illustrative variables on BRICS FDI (Muhammad Azam, 2021; Phillips, 1995). Kao and Chiang (2001) found that DOLS has unmatched tiny example features than FMOLS assessors. A board co-combination technique is then utilized to analyze the variables' long-term connection (Nikolaos, 2017). FMOLS assessors need a standard sequential connection and endogeneity pooling OLS (Baltagi and Kao, 2001; Shudhasattwa, 2016). According to Doan et al. (2019); Ramzan et al. (2021), financial complexity improved ecological corruption was expected to negatively impact fossil fuel byproducts.

METHODOLOGY

All of the data that we used came from the World Bank's Humanitarian Advancement Programmed. Measured in metric tons per capita, CO2 emissions are the survey's dependent variable. International trade (INT) Foreign direct investment (FDI) assessment, GDP, and the tourism industry (TOI) as a whole as the receipt are among the free elements. The labour force, public utilization, international trade, and population of metropolitan areas are included as control variables in both the static and dynamic models. According to Dong and Jiang (2020), the basic positive correlation between CO2 and variables are represented as follows.

$$CO_{2ik} = \int(ENG_{ik}, TOI_{ik}, INT_{ik}, FDI_{ik}, GDP_{ik}, Y_{ik}) \quad (1)$$

Equation (1) is rewritten as follows after adding constant term(C_0) and an error term $\mathcal{E}_{ik}$ where in (C_k) (k=1,2,..,6) represent the coefficients.

$$CO_{2ik} = C_0 + C_1\, ENG_{ik} + C_2\, TOI_{ik} + C_3\, INT_{ik} + C_4\, FDI_{ik} + C_5\, GDP_{ik} + C_6 X_{ik} + \varepsilon_{ik} \quad \textbf{(2)}$$

In order to examine the long-term relationship among components, the study has used the OLS fixed-impact model, FMOLS, DOLS, and SGMM. Since it has been tested by many observational studies and is the most competent evaluator of OLS and set result models, the SGMM model is practical the equation 3 is written as follows:

$$CO_{2ik}=C_0+C_1 CO_{2\,ik-1}+C_2 ENG_{ik}+C_3 TOI_{ik}+C_4 INT_{ik}+C_5 FDI_{ik}+C_6 GDP_{ik}+C_7 Y_{ik}+\varepsilon_{ik} \quad (3)$$

CO2 emissions are included in the review CO2, RE, FDI, GDPPC, and the tourism sector. The main discernible variable in equation 1, CO_{2it-1} defines the impact of the previous year's stress on the current year. For the generosity of the board data assessment outcomes, the Engraving and Sul (2003) DOLS model of appraisal was also finished.

RESULTS AND DISCUSSIONS

4.1 Panel Unit Root Tests

Table 1 displays the results of four coordinated panel unit root tests done on the selected variables at level of first difference. After establishing that all variables were stationaries at the first capability level, all unit root tests rejected the null hypothesis of interest.

Table 2. Panel Unit Root Tests

Variables	Levin Linchu		Pearson		Bruiting		Hadri	
	Level	1st diff.	level	1st diff.	Level	1st diff.	Level	1st diff.
CO_2	0.39	-39.8	4.64	-47.66	8.08	-51.809	40.86	-6.851
	0.0000***	0.0000**	0.0000 ***	0.0000 **	-2	0.0000 **	0.0000 ***	0.0000 **
INT	-8.64	-86.51	-8.39	-60.82	-7.26	-9.75	20.62	6.51
	0.0000 ***	0.0000**	0.0000 ***	0.0000 **	0.0000 ***	0.0000 **	0.0000 ***	0.0000 **
ENG	-4.86	-26.62	-0.08	-9.69	4.51	-7.26	9.09	20.64
	0.0001 ***	0.0000**	-0.51	0.0000 **	-0.75	0.0000 **	0.0000 ***	0.0000 **
FDI	-0.68	-20.51	4.75	-20.08	6.51	-2.46	9.51	46.04
	-0.39	0.0000**	-0.75	0.0000 **	-2	0.0000 **	0.0000 ***	0.0000 **
TOI	-4.75	-40.86	-4.69	-51.51	-4.51	-9.75	9.75	20.69
	0.0000 ***	0.0000**	0.0000 ***	0.0000 **	(0.008) ***	0.0000 **	0.0000 ***	0.0000 **
GDP	-9.6	-40.2	-39.86	-62.75	-27.26	-9.51	9.08	40.64
	0.0000 ***	0.0000**	0.0000***	0.0000 **	0.0000 ***	0.0000 **	0.0000 ***	0.0000 **

Note: "*" and "**" represent the p-value significance leve at 0.005 and 0.01.**

The individual involved in the analysis is confident when it comes to testing the stationarity of the elements using board unit root tests. Therefore, the methodology proposed by Pedroni (2004) was employed to examine the level of coordination among the factors under investigation. The results of all board co-blend tests rejected the null hypothesis of no cointegration and confirmed the presence of cointegration among the variables under consideration. The results of the board co-blend test for Asia Pacific and European countries are shown in Table-2.

Table.2. Panel Co-integration test results

Regular AR coefficients. (Within Component)				
	Stat.	Prob.	Stat.	Prob.
Panel v-Stat.	5.975512	0.0000***	4.356356	0.0000***
Panel rho-Stat.	-4.514642	0.0000***	-4.253564	0. 000***
Panel PP-Stat.	-8.628475	0.0000***	-24.82475	0.0000***
Panel ADF-Stat.	-8.452518	0.0000***	-24.26245	0. 000***
Ordinary AR coefficients. (Inside Constituent)				
	Stat.	Prob.		
Group rho- Stat.	-0.512628	0.0000***		

Group PP- Stat.	-26.26245	0.0000***		
Group ADF- Stat.	-26.74245	0.0000***		

Note: "**" represents the significance of p-value at 0.02 level.**

4.2 GMM Long-run Estimations

Table-3 shows reliable impact model and strategy GMM analysis of CO2, by and large exchange and OLS, innocuous to biological system energy utilization, new direct hypothesis, and the chosen nation's board's development business. The unavoidable findings of GMM for China reveals that the released subordinate components have astonishing measurable meaning, proving the model's rationality. The coefficient of sensible energy is negatively correlated with carbon emissions for China, confirming that increased use of practical energy sources reduces carbon overflow. More specifically, the OLS model demonstrates that 1% higher feasible electricity utilization decreases CO2 emissions by 0.335% and 0.459% in China. Fixed effect models suggest that 1% improvement in tolerable electricity consumption reduces China's CO2 emissions by 0.137% and 0.459%, respectively. GMM demonstrates that 1% improvement in environmentally friendly electricity utilization reduces CO2 emissions by 0.46% and 0.214% in China freely. The OLS, set impact model, and construction GMM results also showed that the coefficient of new direct undertaking on CO2 emissions is large for European countries. The result reveals that using fresh experience will reduce CO2 emissions by 0.035% in the building GMM model and 0.0011% in the set impact model.

Table 4. Represents the results of suggested models

Variables	OLS	FE	(SGMM)
CO_{2t-1}			-2.630***
			-8.08
INT	-0.718***	-0.716***	-0.282***
	-0.039	-0.039	-0.004
ENG	-0.0001	0.0039**	-0.071***
	-0.028	-0.032	-0.032
FDI	-0.000***	0.048***	0.059***
	0	-0.008	-0.004
TOI	0.432***	0.328***	0.428***
	-0.04	-0.032	-0.02
GDP	0.439***	-2.040**	0.439***
	-0.042	-4.86	-0.006
Constant	-26.78***	-2.484***	-33.30***
			-0.063
Observations	2950	2950	2950

Number of ID		320	320
R^2	0.624	0.617	
AR(1)			-2.48(0.0001)
AR(2)			-0.63(0.463)
Sargan test			25959.8(0.1001)

Note: "*" represents the P< 0.01.**

The results of GMM demonstrates that 1% advanced business growth increases CO2 emissions opportunity by 0.024%. As shown by the results, all models have a basic coefficient for China of trade openness, while OLS, FE, and SGMM models agree that with some improvement will increase CO2 emissions. The delayed impacts of OLS and Fixed influence models suggest that a 1% increase in unbounded business will increase China CO2 emissions by 0.41%. By a simple calculation, the SGMM finding suggests that a 1% increase in global commerce will increase CO2 opportunity by 0.33%. The international trade coefficient is very basic in China, and the relationship through CO2 opportunity is bad in all models. The international trade straight burden increases 1%, CO2 transport will decrease by 0.66% in OLS, 0.24% in structure GMM, and 0.31% in set result. Meanwhile, per capita GDP is not important to OLS models where CO2 emissions are positive in system GMM equally for China to make in per capita outright open result would stimulate CO2 opportunity. The legitimate impact model shows that total national production per capita decay CO2 emissions contrary to perception.

4.3 DOLS and FMOLS Estimations

Table 4 shows the prolonged effects of all assessment criteria for two types of burden up co-incorporation since long-term FMOLS and DOLS assessment structures. The results demonstrate that all normal coefficients are quantifiably basic. FMOLS studies have shown for a long time that FDI and actual energy usage influence CO2 emissions. The findings show that tourism industry reduces CO2 emissions and supports the green development hypothesis by attracting a large number of explorers who bring royal bio mix and cleanliness to the area. The study reveals that FDI reduces CO2 launch, contrary to (Ben Jebli, 2015)'s claim that Tunisia's financial progress decays CO2 opportunity. DOLS model results reveal that tourism industry business, commerce, and FDI generate CO2 emissions. Salahud racket et al. (2018) that FDI overhauls CO2 emissions in Kuwait, contrary to Zhu et al. (2016) that DOLS assessment on attainable energy use and 1% expansion in innocuous to the CO2 emission 0.8% by substituting innocuous to the biological system energy despite leftover while increasing suitable effect rather than going before energy.

Table 4. Represents the results of DOLS and FMOLS long-run estimations

Variables	DOLS			FMOLS		
	Co-eff.	t-stat.	Prob.	Co-eff.	t-Stat.	P-value
INT	0.1292	31.658	0.0000***	31.402	834782	0.0000***
ENG	-0.242	-6.9505	0.0000***	51.505	631315.42	0.0000***

FDI	3.568	31.932	0.0000***	-65.631	-2505762	0.0000***
TOI	-0.006	-6.656	0.0000***	-31.92	-29372089	0.0000***
GDP	0.505	8.628	0.0000***	-31.42	-2512089	0.0000***

Note: "*" represents the significance of p-value at 0.01 level.**

Table 5 represents the results of the FMOLS and DOLS tests afterward. Whereas FDI, global trade, and acceptable energy use are the main forces behind increasing CO2 ejection, declining CO2 removal is mostly the result of acceptable energy use, monetary development, and global trade. The results show that, albeit different from those of Salahuddin et al. (2018), plan modifications in FDI increase emanations, as evidenced by the FDI exposures (Zhu et al., 2016). The FMOLS and DOLS models, respectively, show a 0.15 % and 1.50 % reduction in CO2 emissions when a 1% increase in sensible energy utilization is taken into account. When it comes to allowable energy usage, this is consistent with FMOLS and DOLS results. a rise in Tunisia's GDP resulted in a decrease in CO2 emissions from the country (Ben et al., 2015).

CONCLUSIONS

The objectives of the study are to determine the relationship between international trade, foreign direct investment, tourism industry, GDP growth, and CO2 emissions in China. The study has analyzed the data using GMM, DOLS, and FMOLS from 1980 to 2023. The results reveal that the international trade, tourism industry, GDP, and CO2 emissions are significantly positively correlated and with the increase in international trade, GDP growth, and tourism industry the CO2 emissions also increase. The increase in renewable energy and FDI inflows have a significantly negatively correlated to CO emissions and with an increase in renewable energy, and FDI the CO2 emissions decreases. Plans for the tourism sector, foreign direct investment (FDI), the growth of ecologically responsible energy consumption, and exchange receptivity to future work on natural magnificence are all considered to benefit from them. Two more significant sources of fake CO2 emissions, as shown by the DOLS model for China, are FDI and the tourist industry. CO2 emissions have increased due to China's fast economic expansion and rising power use. China is also pushing more FDI in the process of system creation, which would bolster the country's transport industry. The development of international commerce and the adoption of theories related to it should be considered a justifiable response to an unnatural climatic change.

5.1 Future Research Suggestions

In order to achieve environmentally-friendly development, it would be beneficial to examine how strategies pertaining to the transportation industry might be applied. Development of international trade between the two nations is necessary due to their significant susceptibility to environmental corruption.

REFERENCES

1. Abdouli M, Hammami S. Economic growth, environment, fdi inflows, and financial development in Middle East countries: Fresh evidence from simultaneous equation models. Journal of the Knowledge Economy. 2020; 11(2):479–511.
2. Adegboye F, Osabohien R, Matthew O, Olokoyo F. (2020). Foreign direct investment, globalization challenges and economic development: an African subregional analysis. Int J Trade Glob Markets 13(4):1. https://doi.org/10.1504/IJTGM.2020.10023026.
3. Adedoyin FF, Alola AA, Bekun FV. (2020). An assessment of environmental sustainability corridor: the role of economic expansion and research and development in E.U. countries.

Sci Total Environ 713: 136726. 713:136726. https://doi.org/10.1016/j.scitotenv.2020.136726

4. Ali Q, Khan MT, Khan MN (2018) Dynamics between financial development, tourism, sanitation, renewable energy, trade and total reserves in 19 Asia cooperation dialogue members. Journal of Cleaner Production 179:114–131

5. Al-Mulali U, Fereidouni HG, Mohammed AH (2015) The effect of tourism arrival on CO 2 emissions from transportation sector. Anatolia 26(2):230–243. https://doi.org/10.1080/13032917.2014.934701

6. An H, Razzaq A, Nawaz A, Noman SM, Khan SAR (2021) Nexus between green logistic operations and triple bottomline: evidence from infrastructure-led Chinese outward foreign direct investment in Belt and Road host countries. Environmental Science and Pollution Research 28:51022–51045. https://doi.org/10.1007/s11356-021-12470-3

7. Ciacci A, Ivaldi E, Mangano S, Ugolini GM (2021) Environment, logistics and infrastructure: the three dimensions of influence of Italian coastal tourism. Journal of Sustainable Tourism:1 21. https://doi.org/10.1080/09669582.2021.1876715

8. Balli E, Sigeze C, Manga M, Birdir S, Birdir K (2019) The relationship between tourism, CO2 emissions and economic growth: a case of Mediterranean countries. Asia Pac. J. Tour. Res. 24(3):219–232. https://doi.org/10.1080/10941665.2018.1557717

9. Becken S, Simmons DG (2005) Tourism, fossil fuel consumption and the impact on the global climate. Tourism, recreation, and climate change pp.:192–206.

10. Bilgili F, Koçak E, Bulut Ü, Kuloğlu A (2017) The impact of urbanization on energy intensity: panel data evidence considering cross-sectional dependence and heterogeneity. Energy 133:242 256. https://doi.org/10.1016/J.ENERGY.2017.05.121

11. Bölük G, Mert M (2015) The renewable energy, growth, and environmental Kuznets curve in Turkey: an ARDL approach. Renew Sust Energ Rev 52:587–595

12. Buckley, R., (2011). Tour. Environ. Annu. Rev. Environ. Resour. 36, 397–416.

13. Butowski L (2021) Sustainable tourism: a human-centered approach. Sustainability 13:1835. https://doi.org/10.3390/su13041835.

14. Baltagi, B. H., Kao, C., (2001). Nonstationary panels, cointegration in panels and dynamic panels: A survey, in Badi H. Baltagi, Thomas B. Fomby, R. Carter Hill (ed.) Nonstationary Panels, Panel Cointegration, and Dynamic Panels. Emerald Group Publishing Limited. (15); 7-51.

15. Calderón-Vargas F, Asmat-Campos D, Carretero-Gómez A (2019) Sustainable tourism and renewable energy: binomial for local development in Cocachimba, Amazonas. Peru. Sustainability. 11(18): 4891

16. Dogru T, Bulut U, Kocak E, Isik C, Suess C, Sirakaya-Turk E (2020) The nexus between tourism, economic growth, renewable energy consumption, and CO2 emissions: contemporary evidence from OECD countries. Environmental Science and Pollution Research. 27(32):40930–40948. https://doi.org/10.1016/j.renene.2019.02.046

17. Dwyer L, Forsyth P, Spurr R, Hoque S (2010) Estimating the carbon footprint of Australian tourism. J Sustain Tour 18(3):355–376. https://doi.org/10.1080/09669580903513061

18. Doğan, B., Saboori, B., and Can, M. (2019). Does Economic Complexity Matter for Environmental Degradation? An Empirical Analysis for Different Stages of

Development. Environ. Sci. Pollut. Res. Int. 26 (31), 31900–31912. doi:10.1007/s11356-019-06333-1

19. Gasparatos A, Doll CNH, Esteban M, Ahmed A, Olang TA (2017) Renewable energy and biodiversity: implications for transitioning to a green economy. Renew. Sust. Energ. Rev. 70:161–184.

20. Gössling S (2000) Sustainable tourism development in developing countries: some aspects of energy use. J Sustain Tour 8:410–425

21. Gössling S (2013) National emissions from tourism: an overlooked policy challenge? Energy Policy 59:433–442

22. Gössling S, Peeters P (2015) Assessing tourism's global environmental impact 1900-2050. J Sustain Tour 23(5):639–659. https://doi.org/10.1080/09669582.2015.1008500

23. Gössling S, Scott D, Hall CM, Ceron JP, Dubois G (2012) Consumer behavior and demand response of tourists to climate change. Ann Tourism Res. 39:36–58

24. GuarnieriM, Balmes JR (2014) Outdoor air pollution and asthma. Lancet 383(9928):1581–1592

25. Hafeez M, Yuan C, Shah WUIH, Mahmood MT, Xiaolong M, Iqal K (2020) Evaluating the relationship among agriculture energy demand finance and environmental degradation in one belt and one road economies. Carbon Management 11(2) 139–154. https://doi.org/10.1080/17583004.2020.1721974

26. Isaeva, A., Salahodjaev, R., Khachaturov, A., & Tosheva, S. (2020). The impact of tourism and financial development on energy consumption and CO2 emission: evidence from postcommunist countries. Journal of the Knowledge Economy.

27. Işık C, Ongan S, Özdemir D (2019) The economic growth/development and environmental degradation: evidence from the U.S. state-level EKC hypothesis. Environ Sci Pollut Res 26(30):30772–30781.

28. Isik C, Radulescu M (2017) Investigation of the relationship between renewable energy, tourism receipts and economic growth in Europe. Statistika 97(2):85–94.

29. Isik C, Kasımatı E, Ongan S (2017) Analyzing the causalities between economic growth, financial development, international trade, tourism expenditure and/on the CO2 emissions in Greece. Energy Sources B Econ Plan Policy. 12:665–673.

30. Jiang, C., & Ma, X. (2019). The impact of financial development on carbon emissions: A global perspective. Sustainability, 11(19), 5241. https://doi.org/10.3390/su11195241

31. Katircioglu S (2009) Tourism, trade, and growth: the case of Cyprus. Appl Econ 41(21):2741-2750.

32. Katircioglu ST, Feridun M, Kilinc C (2014) Estimating tourism-induced energy consumption and CO2 emissions: the case of Cyprus. Renew Sust Energ Rev 29:634–640.

33. Khan MT, Yaseen MR, Ali Q (2019) Nexus between financial development, tourism, renewable energy, and greenhouse gas emission in high-income countries: a continent-wise analysis. Energy Economics 83:293–310.

34. Kao, C. and M-H. Chiang, (2001). "On the Estimation and Inference of a Cointegrated Regression in Panel Data", in: B.H. Baltagi, T.B. Fomby, R. Carter Hill (Eds), Advances in Econometrics, Non-Stationary Panels, Panel Cointegration, and Dynamic Panels, Vol. 15, JAI Press: Amsterdam.

35. Katircioglu S, Saqib N, Katircioglu S, Kilinc CC, Gul H (2020) Estimating the effects of tourism growth on emission pollutants: empirical evidence from a small island, Cyprus. Air Quality, Atmosphere & Health 13:391–397.

36. Kirikkaleli D, Adedoyin FF, Bekun FV (2020) Nuclear energy consumption and economic growth in the U.K.: evidence from wavelet coherence approach. J Public Aff:1–11. https://doi.org/10.1002/pa. 2130, 21

37. Koçak E, Ulucak R, Ulucak ZŞ (2020) The impact of tourism developments on CO2 emissions: an advanced panel data estimation Tourism Management. Perspectives 33(2020):100611

38. Lasisi TT, Alola AA, Eluwole KK, Ozturen A, Alola UV (2020) The environmental sustainability effects of income, labour force, and tourism development in OECD countries. Environmental Science and Pollution Research 27(17):21231–21242.

39. Le TH, Nguyen CP (2021) The impact of tourism on CO2 emissions: insights from 95 countries. Applied Economics 53(2): 235–261.

40. Li L, Wu B, Patwary AK (2021) How marine tourism promote financial development in sustainable economy: new evidences from South Asia and implications to future tourism students. Environmental Science and Pollution Research.

41. Lopez J, Bhaktikul K (2018) Sustainable environment and tourism industry: an institutional policy analysis of Northeastern Thailand. Pol J Environ Stud 27(1):31–37. https://doi.org/10.15244/pjoes/75198

42. Meo MS, Sabir SA, Arain H, Nazar R (2020) Water resources and tourism development in South Asia: an application of dynamic common correlated effect (DCCE) method. Environ. Sci. Pollut. R. 27: 19678–19687. https://doi.org/10.1007/s11356-020-08361-8

43. M.D. Ramirez, (2006). A Panel Unit Root and Panel Co integration Test of the Complementarity Hypothesis in the Mexican Case, 1960-2001, Center Discussion Paper No. 942, Economic Growth Center Yale University, P.O. Box 208629, New Haven, 2006. CT 06520-8269.

44. Muhammad Azam, M. h. (2021). Determinants of foreign direct investment in BRICS- does renewable and non-renewable energy matter? . Energy Strategy Reviews , 01-10.

45. Moreno-Luna L, Robina-Ramírez R, Sánchez MS-O, Castro-Serrano J (2021) Tourism and sustainability in times of COVID-19: the case of Spain. International Journal of Environmental Research and Public Health 18(4):1859. https://doi/org/10.3390/ijerph18041859

46. Nathaniel S, Barua S, Hussain H, Adeleye N (2020a) The determinants and interrelationship of carbon emissions and economic growth in African economies: fresh insights from static and dynamic models. J Public Aff:e2141

47. Nathaniel S, Khan SAR (2020) The nexus between urbanization, renewable energy, trade, and ecological footprint in ASEAN countries. J Clean Prod 122709:122709

48. Nguyen CP, Su TD (2021) Tourism, institutional quality, and environmental sustainability. Sustainable Production and Consumption 28: 786–801.

49. Nguyen CP, Binh PT, Su TD (2020) Capital investment in tourism: a global investigation. Tour. Plann. Dev. 1–27. https://doi.org/ 10.1080/21568316.2020.1857825

50. Nikolaos Dritsakis, P.S. (2017). Foreign Direct Investment, exports, unemployment and economic growth in the EU members-A panel data approach. International Economics, 443-468.

51. Okumus I, Erdogan S (2021) Analyzing the Tourism Development and Ecological Footprint Nexus: Evidence from the Countries With Fastest-Growing Rate of Tourism GDP.141-154. Springer, Cham.

52. Phillips, P.C.B. (1995), "Fully Modified Least Squares and Vector Autoregression", Econometrica, 63(5), 1023-1078.

53. Pan SY, Gao M, Kim H, Shah KJ, Pei SL, Chiang PC (2018) Advances and challenges in sustainable tourism toward a green economy. Science of the Total Environment.

635:452–469.

54. Pandey S, Dogan E, Taskin D, (2020) Production-based and consumption-based approaches for the energy-growth-environment nexus: evidence from Asian countries. Sustainable Production and Consumption.

55. Paramati SR, Sudharshan R, Alam MS, Chen CF (2017) The effects of tourism on economic growth and CO2 emissions: a comparison between developed and developing economies. J Tourism Res 56 (6):712–724. https://doi.org/10.1177/00472875166678481

56. Peeters P, Dubois G (2010) Tourism tourism under climate change mitigation constraints. J. Transp. Geogr. 18:447–457.

57. Ramzan, M., Adebayo, T. S., Iqbal, H. A., Awosusi, A. A., and Akinsola, G. D. (2021). The Environmental Sustainability Effects of Financial Development and Urbanization in Latin American Countries. Environ. Sci. Pollut. Res., 1–14.

58. Raza SA, Sharif A, Wong WK, Karim MZA (2017) Tourism development and environmental degradation in the United States: evidence from wavelet-based analysis. Curr Issue Tour 20(16):1768–1790. https://doi.org/10.1080/13683500.2016.1192587

59. Razzaq A, An H, Delpachitra S (2021) Does technology gap increase FDI spillovers on productivity growth? Evidence from Chinese outward FDI in Belt and Road host countries, Technological Forecasting and Social Change 172:121050. https://doi.org/10.1016/j.techfore.2021.121050

60. Saint Akadiri S, Alola AA, Akadiri AC (2019) The role of globalization, real income, tourism in environmental sustainability target. Evidence from Turkey. Science of the Total Environment 687:423–432.

61. Sarpong SY, Bein MA, Gyamfi BA, Sarkodie SA (2020) The impact of tourism arrivals, tourism receipts and renewable energy consumption on quality of life: a panel study of Southern African region. Heliyon. 6(11):e05351

62. Shudhasattwa Rafiq, P. S. (2016). Asymmetric oil shocks and external balances of major oil exporting and importing countries. Energy Economics, 01-36.

63. Shahzad, U., Fareed, Z., Shahzad, F., & Shahzad, K. (2021). Investigating the nexus between economic complexity, energy consumption and ecological footprint for the United States: New insights from quantile methods. Journal of Cleaner Production, 279, 123806. https://doi.org/10.1016/j.jclepro.2020.123801

64. Shakouri B, Khoshnevis Yazdi S, Ghorchebigi E (2017) Does tourism development promote CO2 emissions? Anatolia 28(3):444–452

65. Sharif A, Afshan S, Nisha N (2017) Impact of tourism on CO2 emission: evidence from Pakistan. Asia Pacific J Tourism Res 22(4):408–421. https://doi.org/10.1080/10941665.2016.1273960

66. Sharpley R (2000) Tourism and sustainable development: exploring the theoretical divide. Journal of Sustain. Tour. 8:1–19.

67. Solarin SA (2014) Tourist arrivals and macroeconomic determinants of CO2 emissions in Malaysia. Anatolia 25:228–241.

68. Sadorsky P. (2009). Renewable energy consumption, CO2 emissions and oil prices in the G7 countries. Energy Econ 31(3):456–462.

69. Tang C, Zhong L, Ng P (2017) Factors that influence the tourism industry’s carbon emissions: a tourism section life cycle model perspective. Energy Policy. 109:704–718.

70. Tian XL, Bélaïd F, Ahmad N (2020) Exploring the nexus between tourism development and environmental quality: role of Renewable energy consumption and income. Structural Change and Economic Dynamics. 56:53–63.

71. Tsagarakis (2011) Tourists' attitudes for selecting accommodation with investments in renew- able energy and energy-saving systems. Renew Sustain Energy Rev. 15:1335–1342

72. Tugcu CT, Topcu M. (2018). Total, renewable and non-renewable energy consumption and economic growth: revisiting the issue with an asymmetric point of view. Energy 152:64–74.

73. Udi J, Bekun FV, Adedoyin FF. (2020). Modeling the nexus between coal consumption, FDI inflow and economic expansion: does industrialization matter in South Africa? Environ Sci Pollut Res. https://doi. org/10.1007/s11356-020-07691-x

74. Usman M, Kousar R, Makhdum MS. (2020). The role of financial development, tourism, and energy utilization in environmental deficit: evidence from 20 highest emitting economies. Environmental Science and Pollution Research 27:42980–42995

75. Wanner A, Seier G, Pröbstl-Haider U. (2020). Policies related to sustainable tourism–an assessment and comparison of European policies, frameworks and plans. Journal of Outdoor Recreation and Tourism. 29:100275

76. World Tourism and Tourism Council (2019) Tourism & tourism: generating job for youth January 2019. World Tourism & Tourism Council, London.

77. Y. A. Khan, & S. Z. Abbas & Y. M. Chu & M. Ahmad & M. A. Haider, (2020). Study of environmental dynamic through optimized potential variables: renewable energy, Air Quality, Atmosphere & Health. 01-08. Springer Nature B.V. 2020.

78. Zaman K, Moemen MAE, Islam T (2017) Dynamic linkages between tourism transportation expenditures, CO2 emission, energy consumption and growth factors: evidence from the transition economies. Curr Issue Tour 20(16):1720–1735. 10. 1080/13683500.2015.1135107

79. Zaman K, Shahbaz M, Loganathan N, Raza SA (2016) Tourism development, energy consumption and environmental Kuznets curve: trivariate analysis in the panel of developed and developing countries. Tour Management. 54:275–283.

80. Zhang J, Zhang Y (2020) Tourism, economic growth, energy consumption, and CO2 emissions in China. Tourism Economics. 26:1060– 1080. https://doi.org/10.1177/1354816620918458

81. Zhang L, Gao J. (2016). Exploring the effects of international tourism on China's economic growth, energy consumption and environmental pollution: evidence from a regional panel analysis. Renewable and Sustainable Energy Reviews. 53:225–234.