ASSESSING THE NEXUS AMONG INSTITUTIONAL QUALITY, SUSTAINABLE DEVELOPMENT, ENVIRONMENTAL SUSTAINABILITY ON TOURISM: A PANEL DATA ANALYSIS IN BRICS ECONOMIES

Aslam Zaib [a], Syed Romat Ali Shah [b],*, Muhammad Awais Ijaz [c], Muhammad Shahzad Anwer [c]

[a] *Department of ORIC, Balochistan University of Engineering & Technology, Khuzdar, Pakistan*
[b] *Department of Computer Science, The Sahara College Narowal, Pakistan*
[c] *Faculty of Economics and Commerce, The Superior University Lahore, Pakistan*

ARTICLE INFO

ABSTRACT

Tourism is crucial for a country's economic development, especially in emerging economies like that of the BRICS countries. The data for BRICS countries is collected from the World Bank and ICRG for 25 years. The econometric technique NARDL is used in this research to view the short and long-run effects of independent variables on tourism. The Panel NARDL analyses provide a comprehensive examination of the effects of environmental sustainability, sustainable development, and institutional performance on Tourism. They are a helpful tool for analyzing nonlinear interactions. To determine if the BRICS nations have achieved a tipping point in their environmental sustainability the point at which economic growth starts to favorably influence environmental quality and may have an impact on visitor numbers the study employs the increase in GDP as an independent variable. The results of this exhaustive study are crucial for the BRICS officials and stakeholders because they provide light on the connections between tourism, economic growth, sustainability, and institutional performance. Understanding these relationships can help policymakers promote environmental protection and sustainable development in these critical and vibrant businesses while promoting sustainable tourism growth.

INTRODUCTION

Tourism is a major sector that employs a sizable workforce and has a significant impact on society, culture, and the environment. The world's rising economies, notably those in Asia like China and India, continue to be the main drivers of Tourism growth. Both the economic importance. Tourism has experienced significant development and job possibilities as a result of globalization, particularly in underdeveloped and underprivileged nations. Economic development in the second half of the 20th century was driven by industrialized nations. However, it is anticipated that the growth engine will shift to emerging and developing nations, notably the BRICS countries (Awan et al., 2023).

The BRICS countries, who are perhaps the best exemplars of the new world powers, also claim to speak for the developing world. The BRICS countries are not a part of the participating group; rather, they are a separate group. After South Africa's attendance at the BRICS meeting in Sanya, China, in April 2011, the phrase was first used by Goldman Sachs economist Jim O'Neill to refer to the five largest emerging economies: Brazil, the Russian Federation, India, the People's Republic of China, and South Africa. It wasn't because they were neighbors or had worked together in the past on a project. The BRICS countries hardly meet the requirements for a union, notwithstanding their development in that regard. There are more contrasts between them than there are similarities. In terms of overall size, GDP total and per person, and other characteristics, the two economies are very unlike from each other. Even though their GDPs have regularly grown at high rates, China and India outperform the other BRICS countries.

Additionally, their economies differ significantly on a basic level. With their largest populations, most rapidly expanding the economy, and strongest home markets, the BRICS nations have the potential to surpass the seven largest economies by the year 2040 (du Pont et al., 2016).

According to Osinubi et al. (2023) Long known and promoted is the use of tourism as a development instrument (Sharpley, 2020). According to the "Sustainable Tourism Development Charter" that the World Tourism Organisation (UNWTO), United National Environment Programme (UNEP), and UNESCO jointly adopted, the fundamental tenet of environmentally friendly tourism is to "require tourism and nature, culture, and human living surroundings as a whole (Osinubi et al., 2023) According to the sustainable tourism theory, which is founded on the theories of ecology and sustainable development, the expansion of sustainable tourism would necessitate complete coordination of the three-dimensional economic-social-ecological system.

This only implies that tourism must logically blend with the locals' environment, way of life, and culture. When developing sustainable tourism, fairness, sustainability, and commonality should all be taken into account. However, a number of studies have found that tourism is currently less sustainable than it has ever been (Rasoolimanesh et al., 2023). Authorities have added that ecotourism can't develop. Numerous communities may face difficulties as a result of the consistent rise of domestic and foreign tourism. They claim that reducing the sorts of tourism that generate a considerable amount of emissions, such as travel that relies on fossil fuels, is the only way to achieve sustainable

development. Sustainable de-growth is a different strategy for combating tourism expansion.

The growing tourist sector makes a considerable contribution to economic growth, the creation of jobs, and gains in foreign cash. It is impossible to overestimate the significance of institutional performance among the different factors impacting tourism. A country's norms, laws, administration, and infrastructure are only a few of the institutions that have an impact on how welcoming it is to tourists. In order to better understand the connection between institutional performance and visitor arrival in the BRICS states a collection of developing countries with significant tourism potential. This study will focus on these two variables. The BRICS nations Brazil, Russia, India, China, and South Africa represent a sizable portion of the world's population and GDP (Peterson, 2023).

In an effort to attract more tourists, these nations have made major investments in infrastructure and marketing programs connected to tourism. However, in addition to the quantity of money invested, the effectiveness of these investments also partially depends on how well-run the organizations in charge of the tourism sector are. How much of the BRICS countries' tourism potential they can fulfill will depend on their ability to create a favorable institutional environment. Institutional performance in the context of this study relates to the general effectiveness and efficiency of a country's government, legal system, and infrastructure in relation to the tourism sector. A country's commercial friendliness, political stability, security, safety laws, environmental constraints, and infrastructure investment, among other factors, are important Ogbuabor et al. (2024).

Understanding the complex connections between tourism and economic growth in the BRICS nations is the aim of this study. It aims to educate those with an interest in politics, business, and academia on how tourism could support long-term economic progress. It is anticipated that the study's findings will add to the discussion on how crucial foreign travel is to the world economy and how frequently the BRICS countries travel. In terms of new job creation, foreign exchange revenues, and economic expansion, the tourism sector makes a sizable contribution to the world economy (Carvalho, 2023). The BRICS nations have identified tourism as one of the key sectors having the ability to spur economic growth. This study focuses on the complex interplay between tourism and economic development in the BRICS nations. The BRICS countries' economies are becoming more and more reliant on tourism. For instance, according to Fuchs (2021), the tourist industry contributed almost 11% of China's GDP, compared to 8.1% of Brazil's GDP in 2019 (Nyaupane et al., 2020). We can better comprehend how tourism impacts these countries' economies by understanding how economic growth affects visitor arrivals. There is a tonne of unrealized tourism potential in the BRICS nations. A few examples of attractions that entice tourists from outside are South African animals, the vast Russian landscapes, and India's rich cultural heritage (Amirullah, 2021). Planning for sustainable tourist development may help these various locations realize their full potential by taking into account how economic growth influences tourism. International tourism expenditure and arrivals are significantly influenced by the BRICS countries (Amirullah, 2021; Romeo et al., 2021). Their evolving travel patterns may significantly affect how the world's tourist business grows. Paying particular attention to this link can help us better understand the dynamics of international tourism.

Due to the urgent problem of climate change, the idea of environmental sustainability, specifically in relation to CO_2 emissions, has received attention on a worldwide level. The importance of reducing greenhouse gas emissions has been highlighted by the 2015 Paris Agreement and following international climate agreements. With this background, the topic shifts to how much the tourist sector is affected due to CO_2 emissions in the BRICS nations. According to data from the United Nations World Tourism Organisation (UNWTO, 2002), the BRICS countries combined welcomed more than 200 million foreign tourists in 2019, accounting for a sizable percentage of the global tourism industry.

In the setting of BRICS economics, studies of the tourist-growth nexus that take globalization and tourist investment into account do not use a macroeconomic growth framework when evaluating the link between international tourism revenues and economic development (Danish and Wang, 2018). Banday and Ismail (2017) conducted a similar study on the link between foreign tourist receipts and economic development while adjusting for gross capital formation, the size of the labor force, and CO_2 emissions. They don't use growth models in their studies. Awan et al. (2023) examine the connection between tourism and steady economic growth. Therefore, it is likely that these findings' policy ramifications won't promote growth. Therefore, we advise revisiting the issue while taking macroeconomic growth into account.

According to the neo-classical model of long-term economic growth (Tesfatsion, 2016) the pace of exogenous population growth and the advancement of technology determine the increase in an economy's overall production. Mankiw and colleagues (1992) argued that human capital is essential for long-term economic growth based on this neo-classical paradigm. According to Barro (1996) a number of variables, such as higher levels of basic education, longer life expectancies, lower fertility rates, a reduction in government spending, a stronger upholding of the rule of law, lower inflation rates, and better trade conditions, contribute to faster economic growth. Barro (2003) also found that long-term economic development favorably depends on the rule of law and investment ratio, given per capita GDP and human capital. Based on these adaptations of neo-classical theories, the total labor force, gross capital accumulation, and human development may be viewed as the primary drivers behind long-term economic growth.

Ogbuabor et al. (2024) present the importance of FDI inflows in the expansion of the tourism business. As a result, when developing the tourism-augmented growth model, we took into account the indices of financial development and foreign direct investment flows. In light of the aforementioned discussions, we propose the BRICS economies embrace the updated neo-classical model of long-term economic growth. In this controlled environment, it is hypothesized that foreign travel aids in the BRICS nations' long-term economic expansion.

This study will look at the complex connections between tourism and the BRICS nations' capacity to protect the environment, namely CO_2 emissions. In order to look for trends, difficulties, and possibilities, we will investigate the complicated dynamics. Additionally, this study will look at how sustainable practises are used in the travel and tourism industries in the BRICS countries and evaluate how well they support economic growth while reducing CO_2 emissions.

Tourism and Environmental Sustainability

Studies involving a single nation were researched using alternative approaches, such as ARDL, whereas studies involving numerous countries were investigated using FMOL and P-OLS. (Bilgili et al., 2024) did an analysis. The findings back up the EKC

theory by showing that financial expansion decreases carbon emissions while renewable energy raises them. The EKC hypothesis stated that the negative consequences of renewable energy sources influenced the country's carbon emissions, according to Kartal et al. (2023) research on Turkish residents. According to Zhang et al. (2023a), non-renewable energy is the primary source of environmental emissions, despite the fact that renewable energy has minimal effect on those emissions.

Using panel data for Tunisia from 1980 to 2009, Jebli et al. (2015) showed that there is a correlation between the EKC hypothesis on GDP and carbon emission.

Kilinc-Ata and Barut (2024) examined the carbon emissions and energy consumption were cointegrated to account for Turkey's expanding tourist industry. This gave rise to the idea that these characteristics demonstrate how environmental decline has a significant, long-lasting advantage (Altaf et al., 2023).

The Environmental Kuznets Curve (EKC), among other things, emphasizes the significance of economic development for environmental effects. In the early stages of development or as income rises, this empirical model shows how pollution increases from low levels at low incomes. As the economy changes to become less resource-intensive and as technology develops into a post-industrial period, pollution levels will gradually decline. Today's society does not view pollution as a positive aspect of economic development. EKC has received criticism for a number of reasons, including its appraisal of development as a function of income level and its perception of it as linear. The possibility that very polluting companies may transfer from developed to underdeveloped countries is also neglected (Shang et al., 2024).

Additionally, Gan et al. (2024) demonstrated that there is a one-way relationship between CO2 emissions and the study's focus, tourism. Raihan (2024) examined the ARDL model using data for Malaysia from 1972 to 2010 and discovered that there has consistently been a positive association between Tourism and CO2 emissions. According to Younas et al. (2023), a green economy is very necessary to foster economic growth as it prevents environmental degradation and maintains environmental sustainability.

Tourism and Sustainable Development

Tourism has recently seen growth rates that have exceeded all other economic sectors as the tourism industry is important for sustainable development (Awan et al., 2023b). Even though tourism expansion is thought to have only had short-term effects since emigration reversed when tourist activities began to thrive in demographically declining portions of Southern Europe, the tourism sector is an important contributor to the region's long-term development. Furthermore, Qiu et al. (2023) established a long-run equilibrium link between tourist and financial development in low and middle-income countries like Iran and established a long-run equilibrium relationship between tourism and financial development in Taiwan. As a result, tourism was envisioned as a long-term 'cure-all' solution to a wide range of growing-nation challenges.

There aren't many studies that demonstrate how tourism is detrimental to long-term growth. According to Peterson (2023), tourism is to blame for the unequal job and income distributions in rural economies. Negative visitor effects have been associated with poor accessibility, inadequate marketing tactics, a lack of crucial entrepreneurial and tourism experience, and constrained administrative resources in local governments. In a recent study on the effects of tourism, quantitative variables were classified according to the environmental, social, and economic components.

Seyfi et al. (2023) further stressed the necessity for governments to take proactive measures to guarantee ongoing visitor growth. Additionally, tourism helps the economy of the country grow (Awan et al., 2023c), which encourages sustainable growth and ensures prosperity.

Institutional Quality and Sustainable Development

Norms established by institutions to support the rule of law, the constitution, and the traditions required for stakeholder engagement are referred to as "institutional quality". According to previous research, higher institutional quality may have an impact on the flow of tourists. The potential of an economy to be sustainable may also be significantly impacted by the institutional quality in countries with abundant natural resources, according to political risk and poor leadership that hurt the tourism industry. Institutional quality is an important factor in determining visitor flows, according to who also examined how it is related to power, socioeconomic problems, and political risks in connection to tourism (Zhang et al., 2023b).

In the event of political unrest, tour operators and service providers may decide to halt operations. The absence of security and stability brought about by the military's political engagement hinders the growth of the tourist sector. Because these variables might affect visitor inflows, current literature explores the composite aspects of political impacts on the tourism sector, which include nations' regional integrity, safety, security, social stability, institutions, and peace (Mzembe et al., 2023). Furthermore, Wang e al. (2023) showed that foreign visitors are more concerned with political stability, governmental efficacy, rules, and corruption than they are with voice and accountability. Additionally, Musleh et al. (2023) used the balanced panel data of the Asian Pacific area to quantify the asymmetry between all differences in institutional quality and tourism inflows from 1980 to 2018. Between 1995 and 2016, Jahanger et al. (2023) looked into how institutional quality influenced travelers' desire to go abroad.

Additionally, Jahanger et al. (2023) used data from 1996 to 2015 to examine the connection between institutional quality and Malaysian financial and tourism development. Tourism and economic growth are significantly benefited by the administration's effectiveness in eliminating corruption. It seems logical to conclude that institutional quality encourages sustainability and the expansion of the country's tourist industry.

Institutional Quality and Tourism

Institutions have always been underlined in economics, notably the necessity of strong institutions to progress the economy. Studies and evaluations have been done on the value of robust institutions in democracies. Although there is no connection between democracy and more dependable institutions, some people believe that because voters in democracies have greater power, this will lead to better institutions. Governance, which is closely tied to government effectiveness, is used to assess the civil service, the development and implementation of policies, and the legitimacy of a government's commitment to maintaining these traits (Khan et al., 2020).

A state that mainly relies on tourism has significantly low administrative effectiveness as compared to high-income countries. On the other hand, oversee more varied economies that are subject to tougher regulations, exhibiting a relatively high level of long-term government performance. Therefore inadequate governance is a structural problem that limits both expansion and growth (Balli et al., 2016).

Corruption is a major issue impeding the effectiveness of government in terms of economic growth, despite efforts to reduce both its short- and long-term negative effects (Yahyaoui, 2024). Significant reliance on tourism often results in lax anti-corruption measures as a result, these countries' economies are more stable. One of the crucial factors in deciding whether or not tourist demand rises is less corruption. This suggests that countries with rigorous anti-corruption measures would likely 168 attract more tourists, which would promote economic growth. According to Puspita et al. (2024)a researcher on corruption control in Malaysia, as Malaysia's perception of corruption dropped from 50th to 62nd place, the number of foreign visitors to Malaysia reduced by almost 5.8% (or more than 1.5 175 million tourists) between 2014 and 2017. This indicates how tourists' opinions of corruption could be bad for the economy's expansion. Just as crucial to good governance as good governance it is the government's capacity to enact and implement appropriate laws and regulations that permit and support economic growth.

According to Ojonta and Ogbuabor (2024), voice and accountability do not significantly affect foreign tourists to Malaysia, indicating that they are not overly concerned with the level of freedom they encounter. Tang (2018) contends that as long as their impact on personal freedom and responsibility is small, international visitors to Malaysia are not overly worried about the degree of freedom they have. The second most significant element explaining the development in Malaysian tourism demand is political stability. Demand for tourists would rise by 1.4% for every 1% improvement in political stability.

METHODOLOGY
Econometric Model

Data analysis and presentation employ an econometric technique that blends economic, statistical, and econometric methodologies. So, the tool for data analysis is an economic multiple regression technique. The three main steps of the econometric modeling procedure used in this study are data collection, model building, estimate, and model assessment (Mkandawire and Soludo, 1999). In this section, the rationale for using the panel estimate approach is presented. The equation used in this work is as follows and is based on earlier research:

$$logTA_{it} = \alpha_0 + \beta_1 logCO2_{it} + \beta_2 logGDP_{it} + \beta_3 logIQ_{it} + u_{it} \quad (1)$$

In order to ignore the dynamic nature of this data series, all variables have been converted to natural logarithms (Shahbaz and Sinha, 2019). The panel estimate test that was used in this investigation is described below. Several techniques have been created over the past 20 years to demonstrate that time-series data have a longer-term counterbalance relationship. To determine if there is a long-term relationship between variables, a number of well-known techniques have been used, including tests by Johansen and Juselius (1990). Integration of variables is necessary for the test as a whole. In contrast to the description given above, the study will make use of a nonlinear autoregressive distributed lag model (NARDL), which was recently developed by Hatemi (2020). The nonlinear ARDL model approach will be used to analyze the asymmetric behavior of the monitoring variables and their impact on stock returns. Short-run and long-run nonlinearities are included in this econometric model using positive and negative partial sum decomposition of the explanatory variables. This may be accomplished via bound testing (Shin et al., 2014). These approaches allow for the consideration of asymmetry when studying cointegration.

A multivariate nonlinear NARDL limits testing created by Shin et al. (2014) was used to detect the nonlinear and asymmetric cointegration between the variables included in the investigation. NARDL also distinguishes between the short- and long-term impacts independent factors have on the dependent variable. It both demonstrates that there is no relationship between the variables and identifies its course.

Unit Root Test

All of the IV and DV members passed the panel unit root exam. The study used a variety of techniques, such as the Augmented Dickey-Fuller (ADF) unit root test, the Levin, Lin & Chu t, the Im, Pesaran, and Shin W-statistic, to verify that all the variables were constant. Panel unit root tests are performed for every selected variable. Verifying that panel data does not have a tendency towards spurious regression is the aim of the test. The primary purpose of the panel unit root test when utilizing Augmented Dickey-Fuller (ADF) is to address the low power issue. The panel unit root test, which has higher power and a conventional asymptotic distribution, may be used to resolve this problem. The test can thus produce reliable results. Moreover, as noted by Breitung and Pesaran (2005). It is possible to estimate a panel non-linear model if no variable becomes stable at the second differencing. Therefore, variables like regressors and regressed that exhibit seasonality patterns at the level but turn stationary after the first differencing need to be integrated in the same sequence in order to estimate a panel NARDL model (Bertsatos et al., 2022).

When some variables exhibit non-stationarity trends at the level and others are stationary at the level, the panel-based NARDL model can still be estimated. According to Shin et al. (2014). This indicates that while certain variables are fixed at the level, others are not (such as the assortment of I (0) and I (1)).

The initial step in estimating the Panel NARDL model is identifying any cross-sectional data dependency. That being said, first-generation unit root tests (e.g., Hadri Langrage Multiplier (LM) panel unit root test by Hadri (2000) Fisher Type Pane unit root test by Choi (2001) and LLC by Levin et al. (2002) will become unreliable. Rather, the cross-sectional enhanced IPS Panel unit root test, also known as the 2nd-generation Panel unit root testing technique and created by Pesaran (2007) is now essential for estimating seasonality trends (Pesaran, 2007). The following formats can be used to write the IPS Panel unit root formula:

$$CIPS(N,T) = N^{-1} \sum_{i=1}^{N} t_i(N,T) \quad (2)$$

The CD test is used for estimating the cross-sectional dependency test.

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \rho_{i,j} \right) \quad (3)$$

N = No. of BRICS economies within the panel data set, T = Number of observations with respect to the variable under observation, = pairwise correlation of residuals. Table 1 contains estimations from the CD test of Pesaran et al. (2004). As previously mentioned, in the case when neither the regressor nor the regressed are I (2), the Panel NARDL model may be estimated. Cross-sectional dependence and seasonality effects within the data sets are confirmed, respectively, using Person's CD test and the Cross-sectional enhanced IPS Panel unit root test.

Non-Linear Auto Regressive Distributed Lag Model

For both short- and long-term investigation of potential asymmetric effects, the NARDL model is employed. It relaxes the essential presumption that all variables must be integrated in the same order, either I[0] or I[1] or mutually exclusive, with the

caveat that there must be no I(2) variables. This is the main benefit of employing NARDL in cointegration analysis.

Data Collection Methods
This study aims to conduct an experimental investigation of how institutional efficiency and economic growth impact visitor arrivals. As a result, the sample is also made up of BRICS nations based on annual data from 1998 to 2023. The BRICS countries also make up the study's population. Describe the BRICS nations shown in the Table 1 and variable description is shown in Table 2 . This study makes use of five distinct variables and references the literature given in Section Literature Review. To fully investigate how these variables impact visitor arrival, this study uses independent variables. One of the dependent variables is the number of tourists arriving. On five emerging economies Brazil, China, South Africa, Russia, and India data on these factors is compiled from a variety of sources and covers the years 1998 to 2023. There are only 25 years' worth of data available on the WDI & ICGR web pages.

Table 1. BRICS economics.

Country Symbol	Country Name
B	Brazil
R	Russia
I	India
C	China
S	South Africa

Table 2. Variable description.

Symbols	Variables Name	Unit of Measurement	Sources
TA	Tourist Arrival	No. of Tourist arrival	WDI
CO2	Environmental Sustainability	CO2 emissions (metric tons per capita)	WDI
GDP	Sustainable Development	GDP growth (annual %)	WDI
IQ	Institutional Performance	PCA of 6 indicators (Rule of law (Internal Conflict, External Conflict, Corruption, Socio-economic Conditions, Investment Profile)	ICRG

For data analysis and presentation, an econometric approach that integrates economic, statistical, and econometric methodologies is applied. As a result, the tool for data analysis is an economic multiple regression technique. The three primary components of the econometric modelling approach used in this work are data collection, model creation, estimate, and model assessment (Soludo, 1990). The reason why Tourism was chosen as the variable of interest is that you are successfully addressing the goal of your study by combining institution performance, CO2 emissions, GDP effect, and their combined influence on visitor arrivals in the study.

Annual statistics for the BRICS for all five of these factors have been gathered for 25 years, from 1998 to 2023. The numbers were compiled using the World Development Indicators (WDI) and ICRG databases. Table 1 displays each of these variables along with their measurement units and sources. Since both positive and negative changes in the independent factors do not consistently impact the demand for tourism, the current study looks at the asymmetric correlations between the variables. The non-linear "autoregressive distributed lag" model developed by Shin et al.

(2014) is used in the present work to investigate their asymmetric connection.

The following linear equation has been used to examine the long-term relationships between the independent variables and visitor arrival. The asymmetrical impacts of various components on carbon emissions are investigated using the non-linear ARDL technique.

The Variables that we describe as functions of TA are listed below.

$$TA = f\ (CO2,\ GDP,\ IQ) \tag{4}$$

Where letters such as CO2, GDP, IQ, and TA stand in for environmental sustainability, institutional quality, Sustainable development, and tourist arrival, respectively. The research takes advantage of unit root testing. The NARDL test comes after the F-bound exam. The second equation may be expressed as follows when explanatory variables undergo logarithmic transformation with both positive and negative variations:

$$\ln TA_t = \alpha_t + \delta_t + \beta^+ \ln CO2_t^+ + \beta^- \ln CO2_t^- + \beta^+ \ln GDP_t^+ + \beta^- \ln GDP_t^- + \beta^+ \ln IQ_t^+ + \beta^- \ln IQ_t^- + \mu_t \tag{5}$$

In this section the coefficient that was estimated and the recurring outcomes are, where s is the real constant coefficient, is the intercept, and is, and u is the time step t. An expression for the NARDLs framework of Equation (6) is as follows:

$$\begin{aligned} \Delta \ln TA_{it} = {}& \mu + \ln TA_{it-1} + \theta^+ \ln CO2_{it-1}^+ + \theta^- \ln CO2_{it-1}^- \\ & + \vartheta^+ \ln GDP_{it-1}^+ + \vartheta^- \ln GDP_{it-1}^- \\ & + \omega^+ \ln IQ_{it-1}^+ + \omega^- \ln IQ_{it-1}^- \\ & + \sum_{j=0}^{n1} \Delta \ln TA_{it-j} \\ & + \sum_{j=0}^{n2} (\theta_j^+ \Delta \ln CO2_{it-j}^+ + \theta_j^- \Delta \ln CO2_{it-j}^-) \\ & + \sum_{j=0}^{n3} (\vartheta_j^+ \Delta \ln GDP_{it-j}^+ + \vartheta^- \Delta \ln GDP_{it-j}^-) \\ & + \sum_{j=0}^{n4} (\omega_j^+ \Delta \ln IQ_{it-j}^+ + \omega^- \Delta \ln IQ_{it-j}^-) \\ & + \epsilon_{it} \end{aligned} \tag{6}$$

The short-run NARDL elasticities could be determined by using an error-correcting method by utilizing the following formulae.

$$\begin{aligned} \Delta \ln TA_{it} = {}& \mu + \sum_{j=0}^{n1} \Delta \ln TA_{it-j} \\ & + \sum_{j=0}^{n2} (\theta_j^+ \Delta \ln TE_{it-j}^+ + \theta_j^- \Delta \ln TE_{it-j}^-) \\ & + \sum_{j=0}^{n3} (\vartheta_j^+ \Delta \ln EC_{it-j}^+ + \vartheta^- \Delta \ln EC_{it-j}^-) \\ & + \sum_{j=0}^{n4} (\omega_j^+ \Delta \ln IQ_{it-j}^+ + \omega^- \Delta \ln IQ_{it-j}^-) \\ & + \emptyset ECM_{it-1} + \epsilon_{it} \end{aligned} \tag{7}$$

The effects of the variables CO2, GDP, and IQ can be divided into positive and negative components, as we have demonstrated in Eq. (6).

$$\ln CO2_{it} = \ln CO2_0 + \ln CO2_{it}^+ + \ln CO2_{it}^- \tag{8}$$
$$\ln GDP_{it} = \ln GDP_0 + \ln GDP_{it}^+ + \ln GDP_{it}^- \tag{9}$$
$$\ln IQ_{it} = \ln IQ_0 + \ln IQ_{it}^+ + \ln IQ_{it}^- \tag{10}$$

Where lnTA depicts the arbitrarily selected integer, then, $\ln CO2_{it}^+ + \ln CO2_{it}^-$, $\ln GDP_{it}^+ + \ln GDP_{it}^-$, and $\ln IQ_{it}^+ + \ln IQ_{it}^-$, and are used to describe summation processes that

accrue both positive and negative modifications and are recognized as:

$$\ln CO2_{it}^+ = \sum_{j=0}^{t} \Delta \ln CO2_{it}^+ = \sum_{j=0}^{t} \max(\Delta \ln CO2_{j,0}) + \epsilon_{it} \qquad (11)$$

$$\ln CO2_{it}^- = \sum_{j=0}^{t} \Delta \ln CO2_{it}^- = \sum_{j=0}^{t} \max(\Delta \ln CO2_{j,0}) + \epsilon_{it} \qquad (12)$$

$$\ln GDP_{it}^+ = \sum_{j=0}^{t} \Delta \ln GDP_{it}^+ = \sum_{j=0}^{t} \max(\Delta \ln GDP_{j,0}) + \epsilon_{it} \qquad (13)$$

$$Ln\ GDP_{it}^- = \sum_{j=0}^{t} \Delta \ln GDP_{it}^- = \sum_{j=0}^{t} \min(\Delta \ln GDP_{j,0}) + \epsilon_{it} \qquad (14)$$

$$\ln IQ_{it}^+ = \sum_{j=0}^{t} \Delta \ln IQ_{it}^+ = \sum_{j=0}^{t} \max(\Delta \ln IQ_{j,0}) + \epsilon_{it} \qquad (15)$$

$$\ln IQ_{it}^- = \sum_{j=0}^{t} \Delta \ln IQ_{it}^- = \sum_{j=0}^{t} \min(\Delta \ln IQ_{j,0}) + \epsilon_{it} \qquad (16)$$

RESULTS AND DISCUSSION

Descriptive Analyses

The descriptive evaluation for the panel information involves summing and visualizing the key components of your dataset using tools EViews 10. A collection of views performed on several entities over time is referred to as panel data, also known as longitudinal data or repeated measurement data. Descriptive analysis can help interpret the information before going on to more complicated econometric or quantitative investigations. The Jarque-Berra test's the p value of 9.7 and the data's means value of 7.15 showed in Table 3 that the distribution of the information is not at regular levels.

Table 3. Descriptive analysis.

Descriptive	TA	CO2	IQ	GDP
Mean	7.155651	0.783809	2.520693	7.554937
Median	7.117503	0.744939	1.428036	7.002016
Maximum	8.242154	2.248467	9.654487	25.84052
Minimum	6.299071	0.006294	0.213828	0.018993
Std. Dev.	0.538461	0.477774	2.603730	4.318528
Skewness	0.554327	0.650404	1.574159	1.598294
Kurtosis	2.286278	3.147604	4.059731	7.046895
Jarque-Bera	9.779136	9.640625	62.07150	149.5999
Probability	0.007525	0.008064	0.000000	0.000000
Sum	966.0129	105.8142	340.2935	1019.917
Sum Sq. Dev.	38.85203	30.58792	908.4408	2499.057
Observations	135	135	135	135

Unit Root Test Results

A test of statistical significance to determine if the Panel data in the dataset has a unit root is known as the unit root test, especially for data from a panel. If a Panel data variable has a unit root, it is unpredictable, which means that its statistical characteristics, such as means and deviation, change with time. As stationary behavior is a foundational assumption of many models and statistical approaches, it is essential to distinguish between stationary and non-stationary variables in econometrics and time series analysis. I'll provide a brief summary of two of the several unit root tests that are frequently used with panel data. The LLC test results in Table 4 and the IPS test Results in Table 5 suggested by Shin et al. (2014) were the unit-roots used in the investigation.

Table 4. LLC unit root test.

Name of Variables	At Level	At First Difference
TA	-1.78899*	2.26237
CO2	1.90556	-1.68517*
IQ	-1.64517*	-5.22039*
GDP	-1.24590*	-4.01006*

This test extends the conventional Dickey-Fuller unit-root analysis to data from panels. Each unique time series having a unit root, which suggests non-stationarity, is the null hypothesis. The

null assumption is accepted or rejected based on a comparison of the test statistics to crucial values. Based on whether or not hypotheses regarding person- and time-specific effects are made, there are three variants of the Levin, Lin, and Chu test. Based on the outcomes of the panel's unit roots tests, components are added in an alternate series, either during level I (0) or/and after the first differential I. (1).

The IPS analysis takes into account a cross-sectional dependency among each panel's particular time sequences. The augmented Dickey-Fuller (ADF) test is expanded in order to consider cross-sectional dependency. This test is applied if longitudinal dependency raises the likelihood of erroneous regression. The presumption at zero is that every time series has a unit root. The critical coefficients are applied to decide whether to reject the null hypothesis, much like the Levin, Lin, and Chu test.

Table 5. IPS unit root test.

Variables	At level	At first difference
TA	-0.81883	-2.64562*
IQ	-3.26907*	-6.24161*
CO2	0.34398	3.39192*
GDP	-2.19050*	6.39717*

Asymmetric Autoregressive Distribution Lag Model

The research uses a nonlinear model developed by (Herron) to evaluate the possibility of asymmetrical relationships between quality of institutions, tourist expenditure, visitor arrival, and energy usage. Table 6 displays the outcomes of the NARDL algorithm's long-term and short-term estimations. Finding the nonlinear asymmetric link between tourist spending, usage of energy, and quality of institutions is the main goal of this investigation. The estimated coefficients for the positive and negative sums of the changes in the decomposed variables are shown in the long-term system's output. It has been established that there is a long-term imbalance between the decomposed factors and visitor arrival. The nonlinear limitations test F value results of 15.64, which are significant at the 1% level, show a nonlinear long-term relationship between both variables. The decomposing CO2 on tourism with both beneficial and detrimental shocks has coefficients with values of 0.01 and 0.000, respectively, consistent with the long-run NARDL data. The coefficients for the effect of rising (decreasing) CO2 emissions on tourism are highly significant at the level of one percent, which implies that an upsurge in traveller's expenses is anticipated to cause a 0.00% decline in tourism activity while a decrease in carbon emission is anticipated to cause a just 0.01% improve in tourist arrival. The federal government started initiatives to promote output by reducing travel costs, which increases Tourism, but the decline in tourist spending spurs policymakers to strengthen the industry's economy.

As a result, the BRICS economy searches for regulations that may help tourism survive economic downturns. The contrast between a negative effect and a positive shock supports the reliability of the BRICS metrics. Statistics show that these factors, as well as both positive and negative shocks, are related to institutional quality. According to this, for every 1% increase (down) in the quality of institutions, tourist attendance should increase by 0.02 and 0.3%, accordingly. The two instances of how institutional quality may be influenced that were indicated in the section of the study headed "Body of research" that exclusively explored the dynamic interaction between institutional quality and Tourism is supported by the results. Tourism is also significantly and positively impacted by the elasticity of sustainable development

under positive shocks; for every 1% increase in sustainable development, a 0.01% increase in Tourism is projected.

According to the efficiency of usage of energy, a rise in energy use should lead to an increase in visitor numbers. The results demonstrate that the BRICS economies are using energy or technology inefficiently or excessively, which degrades the condition of the environment. With the goal to further explore renewable energy sources and lower travel costs, the BRICS administration must next advance technologies that are energy-efficient and develop their respective economies. The results of the deconstructed variables with positive and negative shocks are consistent with the outcomes over time. Notwithstanding minor differences in estimator values, the associations are quite similar.

Stability Tests

Additionally, stability approaches were used in this study to assess the models' foundational stability. The overall stability of a time series of information or an equation with regression over a period of time is evaluated using statistical methods such as the use of cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ). These tests are frequently used to identify changes or alterations in the basic information generation process in disciplines like econometrics and data quality control. Both methods are effective instruments for tracking and spotting structural alterations in data over time. Changes in the mean, variance, or other statistical characteristics of the data may be responsible for these modifications.

CUSUM Test: Using the CUSUM test, the cumulative sum of the differences between actual and predicted values over time is computed. A structural change in the method used to generate the information is indicated if the CUSUM plot exhibits a persistent rising or decreasing trend. The CUSUM test may be used to determine whether a shift or change in the attributes of the data takes place. It just indicates the alteration's existence without offering any details regarding the change's type.

CUSUMSQ Test: The total amount of the squared variations from the values that were anticipated is used in the expansion of the CUSUM test, also known as the CUSUMSQ test. The CUSUMSQ analysis is used to identify modifications to structure in a series of data or regress models, just as the CUSUM test. It could be more responsive to some modifications, particularly if they entail alterations in the data's variability

Table 6: Asymmetric Long Run Estimations

| Long Run Estimations	Coefficient	Std. Error	t-Statistic	Prob.
IQ_POS	0.035914	0.047628	0.754055	0.4529
IQ_NEG	-0.342213	0.047986	-7.131581	0.0000
GDP_POS	-0.019474	0.006209	-3.136283	0.0024
GDP_NEG	0.028591	0.008242	3.468896	0.0008
CO2_POS	0.015308	0.007403	2.067773	0.0417
CO2_NEG	0.003196	0.011065	0.288868	0.7734
Short Run Estimations				
Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
CointEq(-1)*	-0.786553	0.195421	-4.024916	0.0010
D(IQ_POS)	0.012824	0.028470	0.450458	0.0005
D(IQ_NEG)	0.038243	0.048800	0.783663	0.0004
D(GDP_POS)	0.004333	0.015156	-0.285869	0.7757
D(GDP_NEG)	0.008883	0.012584	0.705933	0.0022
D(CO2_POS)	-0.016813	0.015156	-1.109302	0.0005
D(CO2_NEG)	0.037607	0.025636	1.466990	0.0001
C	0.744233	1.037329	0.717451	0.0001
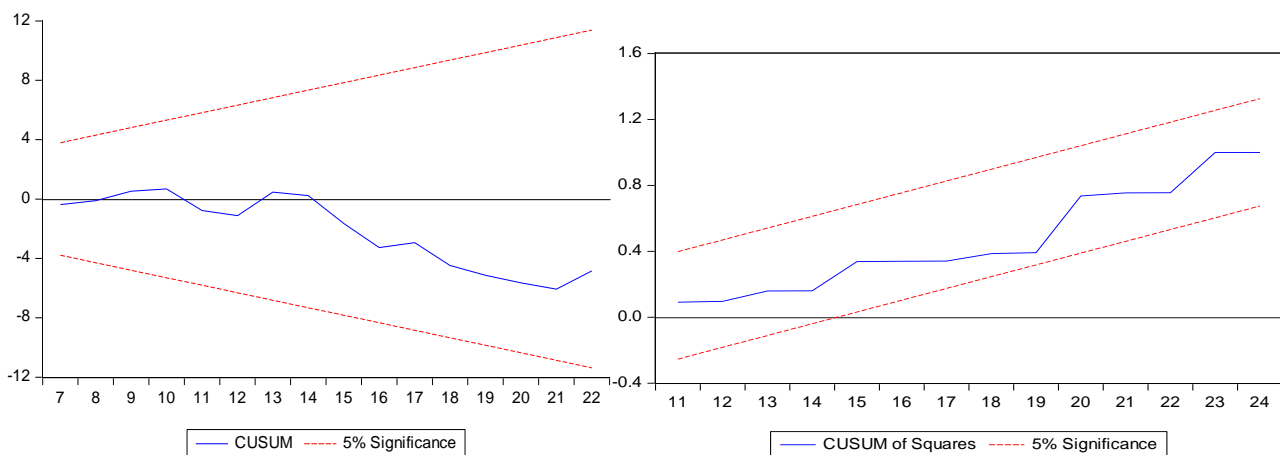
Figure 1. CUSUMSQ Test.

As per the findings of (Brown et al., 1975) each model's values pass the combined total (CUSUM) and the ongoing sum of squares (CUSUMSQ) stability tests, and the predictions have substantial statistical statistics at the five percent (%) level. This is seen in the Figure 1.

Findings
While non-linear auto-regressive distributive lags (NARDL) are used to analyze the non-linear or asymmetric influence, auto-regressive distributive lags are utilized to evaluate the linear or symmetric impact of macroeconomic variables on equity returns. The asymmetric viewpoint is investigated to seek any non-linear relationship between macroeconomic issues and stock returns in order to prevent losing any connection that is not visible in the typical linear settings. The NARDL model would be used to look at both the short- and long-term relationships between the variables. The results could demonstrate that the tourism sector benefits from stricter environmental sustainability regulations. This would indicate that tourists are choosing vacation spots that put an emphasis on environmental preservation and eco-friendliness. It has been demonstrated that robust institutions significantly increase tourism and environmental sustainability.

Effective organizations that encourage sustainable practices and draw visitors all have improved infrastructure, streamlined administrative procedures, and transparent policies. This can be because efforts have been made to preserve the area's assets for future attractiveness. The results show that the panel's health spending and greenhouse gas emissions are cointegrated.

Successful governments, institutions, and policy implementation considerably and favorably enhance people's health. These studies looked into how carbon emissions and environmental degradation harm people's health while boosting government spending on health care. Despite variances between countries, global healthcare spending was high. The authors offered data to support their contention that increased productivity, economic activity, and the use of non-renewable energy sources are to blame for the country's rising GHG emissions and the environmental damage they cause.

Healthcare costs across the nation increase as a result of rising carbon and greenhouse gas emissions brought on by increased usage of non-renewable energy. According to one interpretation of the data, low GDP and poor health infrastructure are mostly to blame for the rise in the prevalence of infectious diseases. The findings of this research are aligned with these studies (Awan et al., 2023d; Arslan et al., 2023; Kanwal et al., 2023).

CONCLUSIONS AND IMPLICATIONS
Readers will have a better knowledge of the size of the BRICS economies as a result of this dissertation. The research's conclusions help us better understand how other factors, such as institutional performance, impact visitor attendance despite the limits of the market we analyzed. The objective of the current study is to ascertain the impact of external and internal performance measures on tourism in the BRICS countries. Among the countries chosen for investigation are South Africa, Brazil, India, China, South Africa, and South Africa. Capable leaders, a lack of corruption, and institutional honesty are traits of high institutional quality. These traits also have an effect on the political and economic stability of a country. A stable country will be chosen by visitors. The BRICS economies' serious problems with efficient governance and information accessibility must be considered while improving institutional quality. The results imply that the BRICS countries' standing in the eyes of the international community may be enhanced by expanding the use of high-quality institutional performance. The tourism and travel sectors would ultimately gain. Along with a rise in tourism, higher institutional quality will assist in a number of ways to longer-term political and economic stability. These elements must be considered while creating policies. The government of the BRICS Countries must thus address the uneven visitor arrival behavior. The BRICS countries may use the findings of the asymmetry research to help them anticipate their economies and formulate policies. The policy states that appropriate measures must be taken to increase investments in high-quality institutions and energy consumption. These measures include the liberalization of economic activity, the development of appropriate regulatory frameworks and tax structures, the construction of port infrastructure, a road network, a rail system, and telecommunications facilities, the achievement of trade-related clarity and labor market adaptability, and the expansion of energy infrastructure. As a consequence, suggestions for new legislation to support honorable organizations, promote tourism, and shield the environment from harm were proposed. The current study has provided a foundation for the BRICS nations' efforts.

There is a favorable correlation between economic growth and Tourism, indicating that the BRICS nations might profit from growth-oriented policies. To promote economic development, governments may think about making investments in the infrastructure, marketing strategies, and legal framework that support the expansion of the tourist industry. The findings of the study might be utilized to underline how important institutional performance is for luring customers. Governments should give enhancing business accessibility, reducing corruption, and strengthening governance high priority since these factors may enhance investment and growth of the tourism sector. The positive relationship between tourism and environmental sustainability highlights the potential financial gains from conserving natural resources and repairing environmental harm. The BRICS nations should uphold environmental regulations, promote ecotourism, and protect their natural resources if they want to attract more tourists.

Policy Recommendations
Invest in tourism-supporting infrastructure, such as roads, lodging alternatives, and tourist destinations, to improve accessibility and the overall visitor experience. Donate money to initiatives that market and encourage travel in order to raise awareness of the natural, historical, and cultural treasures of the BRICS countries. Encourage tourism-related businesses to adopt sustainable practices, and consider developing a certification program to identify eco-friendly hotels and tour operators. Invest in staff capacity-building and training to enhance services and ensure a positive tourist experience. Provide tax advantages and laws that are conducive to investment to entice private sector investment in tourist infrastructure and services. Promote collaboration and coordination among the government agencies responsible for tourism, the environment, and economic development to ensure that policies are consistent and support the expansion of tourism in a sustainable manner. Use state-of-the-art methods to gather data and keep tabs on institutional performance, economic indicators, sustainability indicators, and visitor numbers. This information can help in formulating policies that are supported by reliable data. Pass legislation to protect the environment, including measures to stop global warming, reduce pollution, and preserve natural resources. Boost visitor security and safety measures to provide a welcoming environment for foreign guests. Develop contingency plans for handling crises like

disease outbreaks or natural disasters to limit their detrimental effects on tourism.

Directions for Future Research

The new study will provide a unique viewpoint on the discussion surrounding tourism-led sustainable development for the BRICS countries by taking into account more elements and expanding on the body of earlier research. Future studies may be able to add to the body of knowledge by using data that has been separated for other developing countries, especially sub-Saharan Africa, and accounting for new confounders like demographic and economic globalization.

Researchers may utilize sensitivity analyses to judge how well their findings stand up to various model assumptions, variable definitions, or estimate techniques. Future comparisons between the data from BRICS and non-BRICS countries might look for any unexpected patterns or links in the relationship between the independent variables and Tourism. The authors may combine panel data analysis with time series methodologies to better capture seasonal or cyclical changes in visitor arrivals and examine how they interact with the independent factors.

New researchers can assess how the COVID-19 epidemic has affected the number of tourists visiting the BRICS nations. To Analyse how changing visitor behavior, rules governing health and safety, and plans for economic recovery may affect the link between these independent factors and tourism. Future studies may focus on specialized ecotourism programs and other environmentally conscious travel habits in the BRICS nations. Consider the impact on the national economy and tourism.

Limitation

The non-linear autoregressive distributed lag (NARDL) model, which is employed in this study, includes a number of assumptions and constraints. The results may vary based on the model employed, and this model may not be relevant in all situations. The sizes, demographics, economic structures, and political systems of the BRICS countries vary greatly. We run the danger of ignoring significant cross-national variance in the interactions between factors if we approach them as a homogeneous group. The research may not have taken into account outside variables that might have an impact on Tourism, such as geopolitical events, natural disasters, or global economic trends. Due to the unique environment and features of these nations, the results of this study might not be readily extrapolated to other areas or states outside the BRICS. The results of the investigation might be time-sensitive. Since economic and environmental conditions are subject to rapid shifts, the research's findings could not be applicable for periods longer than the information's time horizon.

Authors Contribution

Aslam Zaib performed the methodology and analyses. Syed Romat Ali Shah presented the Main Idea about the manuscript write the introduction and literature review, and supervise the research. Muhammad Awais Ijaz performed the analyses and interpretation. Muhammad Shahzad Anwer wrote the findings and conclusion.

REFERENCES

Altaf, M., Awan, A., Rehman, S.U., 2023. Exploring the relationship between tourism and environmental degradation in Pakistan's economy: A time series ARDL modelling approach. iRASD J. Econ. 5, 645–662.

Amirullah, M.N.R., 2021. The Role of UNWTO as an international Organization in addressing the impact of Covid-19 on Indonesian tourism. Dev. Econ. 5, 2.

Arslan, S.M., Kanwal, A., Kazmi, S.M.F.A., Rahman, S.U., 2023. The impact of institutional performance and environmental sustainability on foreign direct investment in Pakistan. iRASD J. Econ. 5, 944–965.

Awan, A., Arslan, S.M., Hussain, M., 2023c. Islamic tourism accelerates economic growth expansion: English. Al-Irfan 8, 27–38.

Awan, A., Bibi, M., Bano, F., Shoukat, S., 2023b. A bibliometric analysis on fuel prices fluctuations and tourism under the era of sustainable development. Pakistan J. Humanit. Soc. Sci. 11, 792–813.

Awan, A., Rahman, S.U., Ali, M., Zafar, M., 2023a. Institutional Performance and Tourism Arrival Nexus in BRICS Countries: Evidence from Nonlinear ARDL Cointegration Approach. iRASD J. Econ. 5, 127–139.

Awan, A., Shahid, S., Rahman, S.U., Baig, M.A., 2023d. Analysing the Impact of Macroeconomics Variables on Poverty in Pakistan: A Fresh Insight using ARDL to Cointegration Analysis. IUB J. Soc. Sci. 5, 318–333.

Balli, F., Balli, H.O., Louis, R.J., 2016. The impacts of immigrants and institutions on bilateral tourism flows. Tour. Manag. 52, 221–229.

Banday, U.J., Ismail, S., 2017. Does tourism development lead positive or negative impact on economic growth and environment in BRICS countries? A panel data analysis. Econ. Bull. 37, 553–567.

Barro, R. J., 1996. Determinants of economic growth: A cross-country empirical study: National Bureau of Economic Research Cambridge, Mass., USA. https://www.nber.org/papers/w5698.

Barro, R.J., 2003. Determinants of economic growth in a panel of countries. Ann. Econ. Financ. 4, 231–274.

Bertsatos, G., Sakellaris, P., Tsionas, M.G., 2022. Extensions of the Pesaran, Shin and Smith (2001) bounds testing procedure. Empir. Econ. 62, 605–634.

Bilgili, F., Balsalobre-Lorente, D., Kuşkaya, S., Alnour, M., Önderol, S., Hoque, M.E., 2024. Are research and development on energy efficiency and energy sources effective in the level of CO2 emissions? Fresh evidence from EU data. Environ. Dev. Sustain. 26, 24183–24219.

Breitung, J., Pesaran, M.H., 2005. Unit roots and cointegration in panels. https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=2785225.

Brown, R.L., Durbin, J., Evans, J.M., 1975. Techniques for testing the constancy of regression relationships over time. J. R. Stat. Soc. Ser. B Stat. Methodol. 37, 149–163.

Carvalho, P., 2023. Revitalizing business tourism in the European Union: Strategies for growth. Adm. Sci. 13, 180.

Choi, I., 2001. Unit root tests for panel data. J. Int. money Financ. 20, 249–272.

Danish, Wang, Z., 2018. Dynamic relationship between tourism, economic growth, and environmental quality. J. Sustain. Tour. 26, 1928–1943.

du Pont, Y.R., Jeffery, M.L., Gütschow, J., Christoff, P., Meinshausen, M., 2016. National contributions for decarbonizing the world economy in line with the G7 agreement. Environ. Res. Lett. 11, 54005.

Fuchs, K., 2021. How are small businesses adapting to the new normal? Examining tourism development amid COVID-19 in Phuket. Curr. Issues Tour. 24, 3420–3424.

Gan, H., Zhu, D., Waqas, M., 2024. How to decouple tourism growth from carbon emission? A panel data from China and tourist nations. Heliyon 10, 15.

Hadri, K., 2000. Testing for stationarity in heterogeneous panel data. Econom. J. 3, 148–161.

Hatemi-J, A., 2020. Hidden panel cointegration. J. King Saud Univ. 32, 507–510.

Jahanger, A., Usman, M., Ahmad, P., 2023. Investigating the effects of natural resources and institutional quality on CO2 emissions during globalization mode in developing countries. Int. J. Environ. Sci. Technol. 20, 9663–9682.

Jebli, M. Ben, Youssef, S. Ben, 2015. The environmental Kuznets curve, economic growth, renewable and non-renewable energy, and trade in Tunisia. Renew. Sustain. Energy Rev. 47, 173–185.

Johansen, S., Juselius, K., 1990. Maximum likelihood estimation and inference on cointegration—with appucations to the demand for money. Oxf. Bull. Econ. Stat. 52, 169–210.

Kanwal, A., Khalid, S., Alam, M.Z., 2023. Analyzing the asymmetric effects of green finance, financial development and FDI on environment sustainability: New insights from Pakistan Based Non-Linear ARDL Approach. iRASD J. Econ. 5, 625–644.

Kartal, M.T., Erdogan, S., Alola, A.A., Pata, U.K., 2023. Impact of renewable energy investments in curbing sectoral CO2 emissions: Evidence from China by nonlinear quantile approaches. Environ. Sci. Pollut. Res. 30, 112673–112685.

Khan, Muhammad Asif, Popp, J., Talib, M.N.A., Lakner, Z., Khan, Muhammad Atif, Oláh, J., 2020. Asymmetric impact of institutional quality on tourism inflows among selected Asian Pacific countries. Sustainability 12, 1223.

Kilinc-Ata, N., Barut, A., 2024. The influence of tourism on the UAE'S energy-related climate goals: Cointegration Analysis. J. Hosp. Tour. Educ. 1–13.

Mkandawire, P.T., Soludo, C.C., 1999. Our continent, our future: African perspectives on structural adjustment. Idrc. https://eprints.lse.ac.uk/38840/.

Musleh, M., Subianto, A., Tamrin, M.H., Bustami, M.R., 2023. The role of institutional design and enabling environmental: Collaborative governance of a pilgrimage tourism, Indonesia. J. Local Gov. Issues 6, 75–90.

Mzembe, A.N., Koens, K., Calvi, L., 2023. The institutional antecedents of sustainable development in cultural heritage tourism. Sustain. Dev. 31, 2196–2211.

Nyaupane, G., Paris, C., Li, X., 2020. Introduction: Special issue on domestic tourism in Asia. Tour. Rev. Int. 24, 1–4.

Ogbuabor, J.E., Agu, C., Mba, I.C., 2024. Do foreign direct investment inflow and trade openness influence international tourism demand in Africa? A study of the post-global financial crisis era. J. Travel Res. 63, 1894–1912.

Ojonta, O.I., Ogbuabor, J.E., 2024. Effects of international tourism on environmental quality and renewable energy use in Africa: a study of the moderating role of governance institutions. Econ. Chang. Restruct. 57, 149.

Osinubi, T., Adedoyin, A., Olufemi, O., Ajide, F., 2023. Does tourism affect sustainable development in MINT countries? Glob. J. Emerg. Mark. Econ. 15, 72–92.

Pesaran, M.H., 2007. A simple panel unit root test in the presence of cross-section dependence. J. Appl. Econom. 22, 265–312. https://doi.org/10.1002/jae.951.

Pesaran, M.H., Schuermann, T., Weiner, S.M., 2004. Modeling regional interdependencies using a global error-correcting macroeconometric model. J. Bus. Econ. Stat. 22, 129–162.

Peterson, R.R., 2023. Over the Caribbean top: community well-being and over-tourism in small island tourism economies. Int. J. Community Well-Being 6, 89–126.

Puspita, N.Y., Sharma, A.K., Bohra, S., Muhamad, M.M., Siong, W.H., Kumar, B.K., 2024. Asia-Pacific Journal on human rights And the LAW. https://heinonline.org/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/apjur25&section=9.

Qiu, H., Wang, X., Wu, M.-Y., Wei, W., Morrison, A.M., Kelly, C., 2023. The effect of destination source credibility on tourist environmentally responsible behavior: An application of stimulus-organism-response theory. J. Sustain. Tour. 31, 1797–1817.

Raihan, A., 2024. The interrelationship amid carbon emissions, tourism, economy, and energy use in Brazil. Carbon Res. 3, 11.

Rasoolimanesh, S.M., Ramakrishna, S., Hall, C.M., Esfandiar, K., Seyfi, S., 2023. A systematic scoping review of sustainable tourism indicators in relation to the sustainable development goals. J. Sustain. Tour. 31, 1497–1517.

Romeo, R., Russo, L., Parisi, F., Notarianni, M., Manuelli, S., Carvao, S., 2021. Mountain tourism–Towards a more sustainable path. https://openknowledge.fao.org/items/748ad469-180a-4f29-8eed-0c7c90f6cc3d.

Seyfi, S., Hall, C.M., Vo-Thanh, T., 2023. The gendered effects of statecraft on women in tourism: Economic sanctions, women's disempowerment and sustainability?, in: Gender and Tourism Sustainability. Routledge, pp. 285–302.

Shahbaz, M., Sinha, A., 2019. Environmental Kuznets curve for CO2 emissions: a literature survey. J. Econ. Stud. https://doi.org/10.1108/JES-09-2017-0249

Shang, M., Peng, M.Y.-P., Anser, M.K., Imran, M., Nassani, A.A., Binsaeed, R.H., Zaman, K., 2024. Evaluating the U-shaped environmental kuznets curve in China: The impact of high technology exports and renewable energy consumption on carbon emissions. Gondwana Res. 127, 272–287.

Sharpley, R., 2020. Tourism, sustainable development and the theoretical divide: 20 years on. J. Sustain. Tour. 28, 1932–1946.

Shin, Y., Yu, B., Greenwood-Nimmo, M., 2014. Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework, in: Festschrift in Honor of Peter Schmidt. Springer, pp. 281–314.

Soludo, C.C., 1990. Structure and performance of Nigeria's Financial System. Read. Urban Reg. Econ. Onitsha Verit. Press Co.

Tang, C.F., 2018. Does the source of foreign direct investment matter to economic growth in Malaysia? Glob. Econ. Rev. 47, 174–181.

Tesfatsion, L., 2016. The basic Solow-swan descriptive growth model. https://faculty.sites.iastate.edu/tesfatsi/archive/tesfatsi/solowmod.pdf.

UNWTO, 2002. Tourism statistics: World Tourism Organization. https://www.e-unwto.org/doi/book/10.18111/9789284406876.

Wang, X., Wang, Y., Wei, C., 2023. The impact of natural resource abundance on green economic growth in the belt and road countries: The role of institutional quality. Environ. Impact Assess. Rev. 98, 106977.

Yahyaoui, I., 2024. How corruption mitigates the effect of FDI on economic growth? J. Knowl. Econ. 15, 1344–1362.

Younas, S., Shoukat, S., Awan, A., Arslan, S.M., 2023. Comparing effects of green innovation and renewable energy on green economy: the metrics of green economy as nucleus of SDGs. Pakistan J. Humanit. Soc. Sci. 11, 1035–1051.

Zhang, L., Abbasi, K.R., Hussain, K., Abuhussain, M.A., Aldersoni, A.,Alvarado, R., 2023b. Importance of institutional quality and technological innovation to achieve sustainable energy goal: Fresh policy insights. J. Innov. Knowl. 8, 100325.

Zhang, Y., Li, L., Sadiq, M., Chien, F., 2023a. The impact of non-renewable energy production and energy usage on carbon emissions: evidence from China. Energy Environ. 0958305X221150432.