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Establishing an Empirical link between Financial Development, CO2 Emissions, Tourist Arrivals and Economic Growth: A Dynamic Panel Data Approach

Sumaira Lodhi [1]   Muhammad Salahuddin Ayyubi [2]   Shakeel Hayat [3]   Zahid Iqbal [4]

Abstract: *The study is an attempt to see the impact of changes in environmental, economic, trading, and financial conditions on tourist arrivals of 123 countries from Europe, America, Asia and Africa. The countries were distributed in seven distinct regions on the four continents. In order to perform an effective empirical analysis, panel data from these countries was obtained from World Development Indicators from 1999 to 2018. The results of panel cointegration revealed the presence of a long-run relationship between tourist arrivals and the explanatory variables included in the model. Environmental conditions were found to adversely affect tourist arrivals with rising CO2 emissions, whereas improvements in financial development contributed towards increased tourist arrivals. The results of the study encouraged the implication of eco-friendly policies and financial development for tourism promotion in selected 123 countries from seven regions.*

**Key Words:** CO2 Emissions, Tourist Arrivals, Economic Growth, Financial Development, Trade Openness

Introduction

An important industry that contributes heavily to economic development is tourism, as it can serve as a catalyst for economic development. It is a broad industry with several facets that include a variety of pursuits, including travel, hotel, food and beverage services, leisure, and entertainment. Tourism economics is concerned with the financial elements of the industry, particularly its contribution to economic growth. Many theories have been proposed to explain how financial development can promote tourism and economic growth and development, and its positive effects on the economy are well known (Cheng and Zhang, 2020; Apleni, 2017; Peterson, Cardenas, and Harrill, 2014; Khamrang, 2013).

According to Travel, Tourism and hospitality statistics, the contribution of the tourism industry to global GDP increased by 21 per cent in 2021 after sharply dropping in 2020 due to (COVID-19). The travel and tourism industry contributed almost 5.81 trillion U.S dollars in 2021, with an increase of one trillion dollars, though not catching up with pre-pandemic contribution and statistics.

Figure 1

Total contribution of travel and tourism to gross domestic product (GDP) worldwide from 2019 to 2021(in billion US dollar)
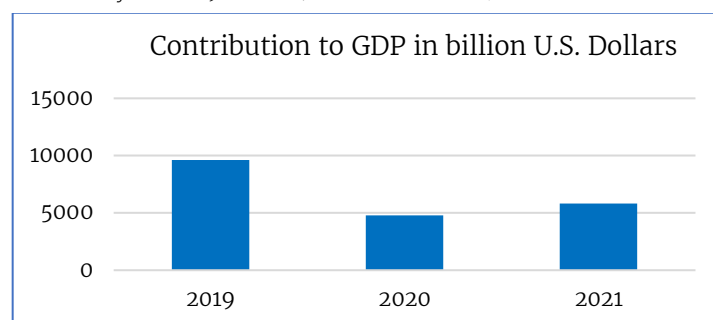
Source: Research department, statista

[1] Lecturer, Department of Economics, Forman Christian College (A Chartered University), Lahore, Punjab, Pakistan.
[2] Assistant Professor, Department of Economics, Forman Christian College (A Chartered University), Lahore, Punjab, Pakistan.
[3] Lecturer, Center for Water Informatics & Climate Resilience (CWC), IMSciences, Hayatabad, Peshawar, Khyber Pakhtunkhwa, Pakistan.
[4] Associate Professor, Department of Economics, Forman Christian College (A Chartered University), Lahore, Punjab, Pakistan.

- **Corresponding Author:** Shakeel Hayat (shakeel.hayat@imsciences.edu.pk)

Lee ([2021](#)) observed that the number of international tourists will increase by 3.3% per year by 2030. Asia, Africa and Middle Eastern countries are expected to reap much greater benefits from tourism in future. With the active role of media and information technology (ICT), marketing, advertising and digitalization of the tourism industry, the demand for tourism has tremendously increased, while tourism taxes in destination countries may lead to reduced tourism demand and income.

Figure 2

International Tourist arrivals in millions by region
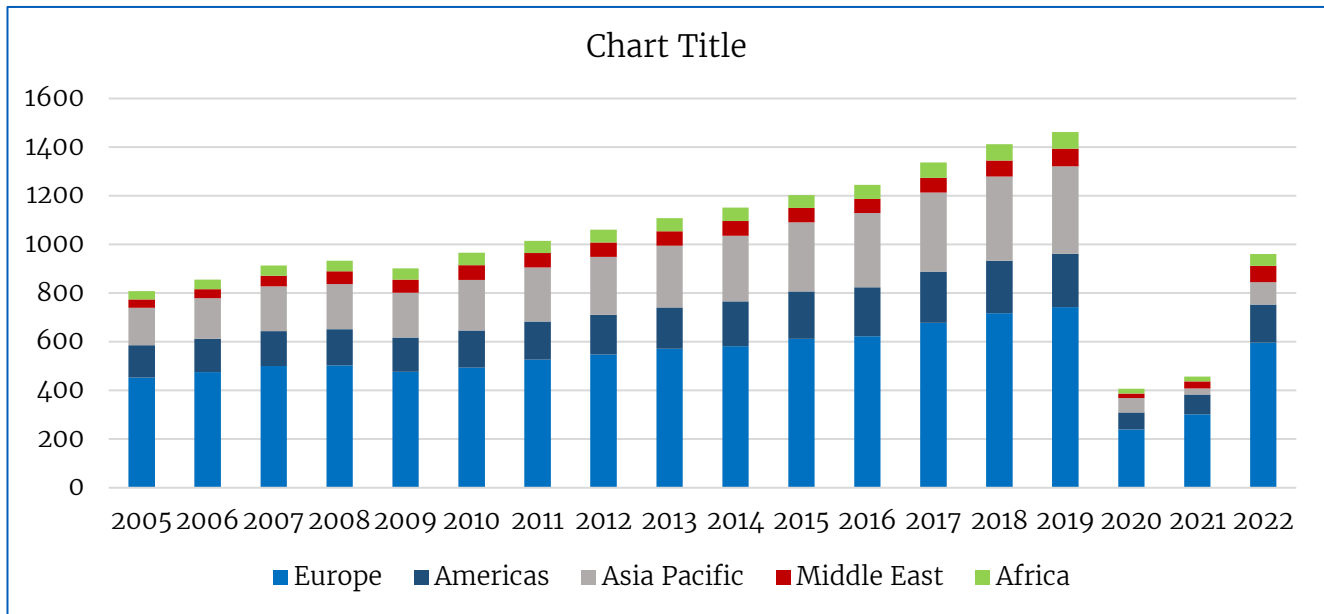
Source: Statista

Tourism economics is a branch of economics that studies the economic aspects of tourism, including the demand and supply of tourism services, the impact of tourism on the economy, and the policies and strategies that can be used to promote tourism and its economic benefits. The theories behind tourism economics can be divided into three main categories: demand-side, supply-side, and impact-related theories.

Tourism economics is a subfield of economics that focuses on the economic aspects of tourism, including the demand and supply of tourism, the economic impact of tourism, and the policies and strategies that can promote sustainable tourism development. The role of tourism in promoting economic development has been widely recognized, and there are several theories that explain how tourism can contribute to economic growth and development.

Dependency Theory

This theory argues that tourism can reinforce the dependence of developing countries on developed countries, as the majority of tourism revenue is generated by developed countries. However, proponents of this theory also suggest that tourism can be a tool for reducing dependence by diversifying the economy and promoting local entrepreneurship. The theory is applied to areas that heavily depend on a certain economic factor to survive. Communities that rely profoundly on the revenue generated from tourism can improve if these sites are improved by increasing their demands through tourist opportunities. This can include advertising local culture. Infrastructure with safe routes and transport options and technology that makes tourist stays easier, such as network connections.

Sustainable Tourism Theory

Sustainability refers to something that is long-lasting. Sustainable theory refers to the equality between different economic classes and different generations on a global level. This means that the resources should be available for all generations and should be long-lasting. The sustainable theory is important because it

enables the identification of the degradation of the environment due to human activity and how it can be stopped to improve the quality of the environment.

Tourism and sustainable development theory are deeply interlaced. Tourism is said to be one of the fastest-growing sectors in terms of economic growth. Tourism clearly has the capability to fulfil sustainable development goals by generating good revenue and protecting the environment. When this theory is applied to tourism, it focuses on reducing the pessimistic effects of tourists on the environment and increasing the positive effects on social and economic benefits. Tourism, when linked with sustainable development theory, has some main goals that include social responsibility, environment protection, economic viability and sustainability.

This theory emphasizes the importance of sustainable tourism development, which balances economic, social, and environmental factors. By promoting sustainable tourism practices, tourism can contribute to economic development while also protecting natural and cultural resources and improving the well-being of local communities. The theory is built around the idea that tourism can be sustainable in future when present resources are responsibly utilized. The right tourism policies should promote the industry, keeping the local community and the visitors into consideration so that it leaves a positive social, economic and, most of all, environmental impact. A sustainable policy corroborates the perseverance of nature while generating funds for the country. Although the main focus is nature, the environment is completed when both parties are equally respected for their social customs. A clean and hospitable environment increases the scenic beauty of tourist sites, making them more popular and consequently helping the country prosper.

Demand-side Theory

Demand-side theory reflects that economic growth can be achieved by appreciating the high demand for goods and services. Demand is basically the ability of a consumer to buy a good. This theory is also provided by Keynes. In this theory, Keynes explained that the producers would not want to supply goods that are not demanded by the people. Only the goods that have high demand will be produced and supplied by the suppliers since it will profit them. Keynes argued in this theory that economic growth is directly based on aggregate demand. Hence, linking tourism and demand-side theory would enable us to understand the motive behind why people travel, what attracts them to travel, what things they consider as a necessity and what indicators can be improved to attract more tourists. Tourism brings in money, and when income increases, people have the opportunity to travel. Many factors influence tourism demand, such as health problems, economic crises, natural disasters, etc. The demand-side theory makes it easier for us to understand the preferences of tourists.

Demand-side theories of tourism economics focus on the factors that influence the demand for tourism, such as income, prices, tastes and preferences, and the availability of information. These theories explain how changes in these factors can affect the volume and type of tourism and how tourism can contribute to economic growth by generating demand for goods and services in the destination. The theory refers to the idea that economic growth depends on the demand for goods and services the country or region is producing. Demand can be increased by increasing tourist attractions, such as improving the quality of goods produced and sold in the region, which will attract more outsiders to invest their money in local businesses. Allowing the residents the resources to sell their crafts in the market will increase its demand. The increase in income will bring diverse ideas and unique products to the market that can escalate the desirability of tourist sites, consequently increasing the demand for a larger customer.

Supply-side Theory

Unlike the demand side theory, the supply side theory argues that by increasing the supply/production of goods and services, economic growth increases. Job opportunities increase, businesses expand, and entrepreneurs are given more chances. This theory supports the increase in aggregate supply. One of the examples of supply-side theory is monetary policy. In this policy, the government regulates the circulation of money by lowering borrowing rates. Tax policy and regulatory policy are also examples of supply-side theory.

Hence, the supply side theory makes it easier for us to understand indicators that help and contribute to the success and advancement of the tourist industry. It helps in identifying sectors for investment, such as infrastructure, that eventually pave the way for sustainable growth in the long run.

Supply-side theories of tourism economics, on the other hand, focus on the factors that influence the supply of tourism, such as the availability of natural and cultural resources, the level of investment in tourism infrastructure and facilities, and the level of competition among tourism destinations. These theories explain how changes in these factors can affect the quality and competitiveness of tourism and how tourism can contribute to economic growth by stimulating investment and innovation in the tourism industry.

The role of tourism in promoting economic growth has been widely recognized, and there are several theories that explain how tourism can contribute to economic growth and development.

Figure 3
Economic theories linking tourism promotion and its benefits
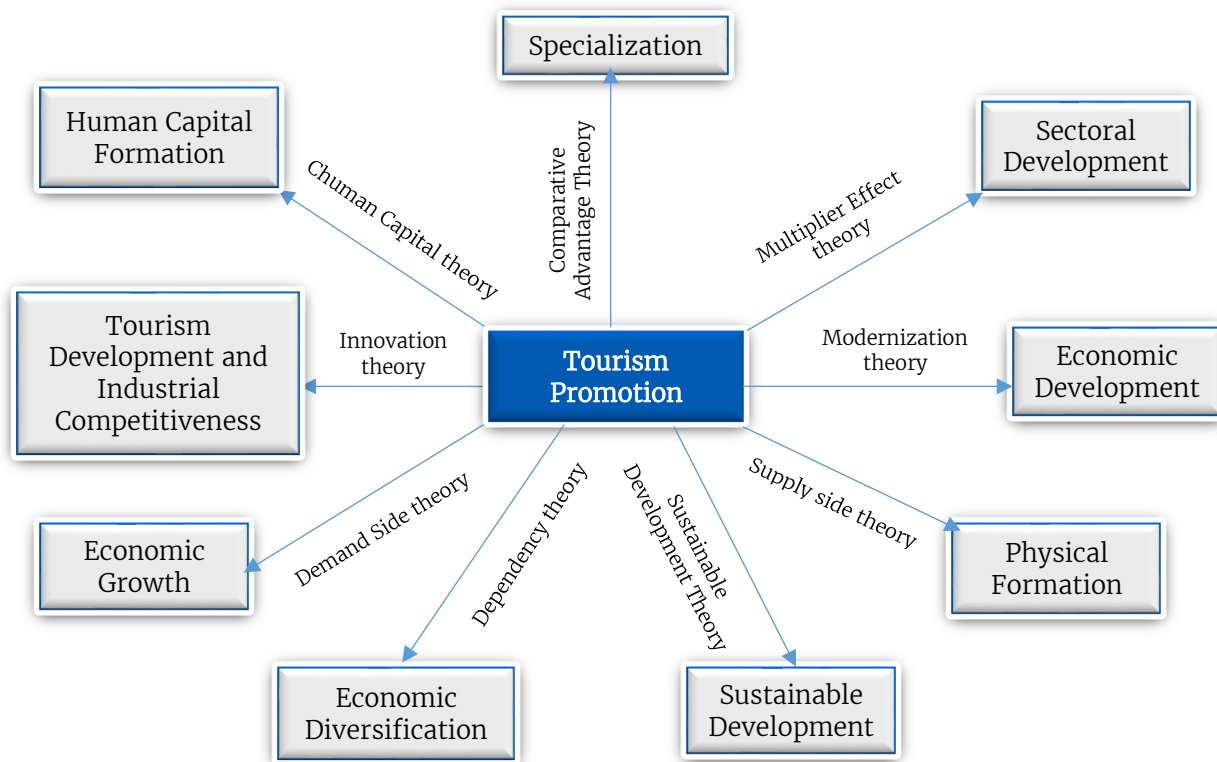
Source: Author's own illustration

Literature Review

Tourism Economics holds great importance for developed and developing economies. The literature shows that tourism receipts have the potential to contribute to economic growth and the development of the economies (Li, Jin and Shi, 2018). The first few studies that investigated the relationship between tourism and economic growth were those of Ghali (1976) and Lanza, Markandya and Pigliaru (2005). Tourism-led economic growth (TLGH) and economic-led tourism hypothesis (ELTH) have been the focus of the literature on tourism economies for the last few decades. (Brida et al., 2016) showed that the amount of capital and labour accompanied by increased exports leads to economic growth. In addition to this, the study also revealed that tourism income can be used to increase capital through import.

Van Truong and Shimizu (2017) observed the impact of transportation on tourism using the CGE model, though the study emphasized incorporating more and more transportation accessibility factors into the CGE model to appropriately validate the interrelationship between tourism and transportation. The environment tends to play a substantial role in the tourism industry and its development. Air quality is the key variable that has been discussed in previous studies, including that of (Eusebio et al., 2023). Research

has shown that island states may cease to exist, and if necessary, measures to control climate change effects are not taken in due time (Kendall, 2012). Improved terms of trade, increased tax revenues, additional sources of income and employment opportunities are some benefits created by tourism promotion and income attained through it (Lee and Taylor, 2005; Kim et al., 2006; Bohlmann and Van Heerden, 2008; Li et al., 2018).

Spasojevic, Lohmann and Scott (2018) revealed that research needs to be done on themes of passenger experiences, aviation and tourism, as well as the impact of low-cost carriers on tourism in future research studies. Bethapudi (2013) revealed that ICT plays an important role in finding information about travel bookings, shopping online, payment mechanisms, and food and restaurants. Economic growth and ICT are greatly linked to each other (Kumar and Kumar, 2020; Kumar et al., 2015; Madden and Savage, 2000; Pohjola et al., 2020; Anser et al., 2022; Nguyen and Nguyen, 2022; Torrent-Sellens, 2016).

Moving on, the benefits of tourism for a country are immense. A high rate of tourism will encourage firms to invest in that country, which will improve the country's infrastructure and bring in more jobs for the locals. More jobs and more firms will increase the country's growth and lead to an increase in the country's GDP. There will be more competition and more investments in other areas like industries (Blake et al., 2006; Lemmetyinen and Go, 2009). Statistics also tell us that poor, underdeveloped countries that are struggling and on the verge of economic collapse can be saved if they work to promote tourism.

If we talk about financial development, it is imperative that we first understand the concept of access to finance, so access to finance is an essential dimension of financial development that enables businesses to obtain the necessary funds to expand and invest in their operations. Similarly, the ability of low- and middle-income tourism SMEs to connect with global value chains in the tourism industry depends critically on access to finance in the sector. Entrepreneurs and tourism businesses can obtain formal financing thanks to financial inclusion, which also helps them raise the resources they need for their businesses. According to Fomum and Opperman, 2023, increased productivity, which is directly correlated with increased access to financing, fosters economic growth.

A major dimension of financial development is Foreign Direct Investment (FDI). Successful tourist growth is mostly dependent on foreign direct investments, which are dominated by major transnational corporations (Endo, 2006). Participation in vertically integrated tourism networks of multinational corporations may assist countries, but there is a risk that these corporations will reap the benefits of tourism growth figures (Van der Sterren, 2008). Foreign Direct Investments in the tourism sector are not common in developing nations. Since these businesses use non-equity types of investing, the only actual tangible investments in real estate, hotels, and restaurants in tourist regions are hidden. Hotel investments are part of total real estate investments, and hotels just set up management or lease agreements (Endo, 2006).

Fauzel and Seetanah (2023) reported the detrimental effect of declining financial development on inbound and outbound tourists in Mauritius using dynamic regressions from 1980-2018. Kumar and Kumar (2013) found similar results for Fiji by using the same techniques (ARDL) besides reporting the favourable effects of urbanization and economic growth on tourist arrivals and therefore concluded that tourism was reported to be 0.13 per cent per worker output while financial development had the leading instrumental power because in the long-run, every 1 per cent increase generated 0.71 per cent increase in the sector.

The role of informal financial institutions in tourism has also been of interest to researchers. Ngoasong and Kimbu (2016) explored how informal microfinance encouraged entrepreneurs to set up small firms offering tourism services in Cameroon with the help of a micro-ethnographic study.

The role of information technology has affected every aspect of life in the twenty-first century, and tourism is no exception in this regard. Kumar (2014) examined the role of information technology and financial development on economic growth in Vietnam from 1980-2010 and reported that both of them have a favourable effect on growth with the help of improvements in productivity. The benefits of mobile technology adoption in the financial sector have continuously gained momentum, and the utility of mobile payment systems cannot be exaggerated.

Moreover, the nature of impact from (Rasool, Maqbool and Tarique, 2021) explained this wonderfully in their article that inbound tourism importance has grown over the years significantly, and he says that inbound tourism significantly enhances economic growth, which also brings more investments and human

capital to the country. The benefit of this will be more and more jobs for the local population, an increase in wages and high productivity, which will ultimately lead to economic development and improve the standards of living in a country.

Almeyda-Ibáñez and George (2017) briefly explained that the advertisement and promotion of tourist destinations will automatically increase demand, which will then lead to high competition between the local businesses, and this will then lead to innovation and more and more entrepreneurship and innovation. There are many benefits to innovation. First of all, it will increase tourist experiences, thereby attracting more and more people to the tourist destination. Good experiences for tourists will also lead to economic growth and development. High levels of tourism through innovation can also help develop tourist destinations as the revenue earned from tourism can be invested back into the business to make way for new small businesses and attract people from other parts of the world.

Apart from the positive impacts of tourism, it is also seen to have produced negative impacts in terms of the deindustrialization of some sectors (Copeland, 1991). Some research (Holzer and Millo, 2005; Capo et al., 2007) has highlighted over-exploitation of natural resources as the negative outcome of increased cost of living (Copeland, 1991; Sheng and Zhao, 2016; Sheng and Tsui, 2009). Environmental and social externalities have also been an outcome of increased tourism in some economies (Jaremen, Nawrocka and Żemła, 2020; Saenz-de-Miera and Rosello, 2014)

Furthermore, research also states that the European Parliament estimates that more than 2 million businesses, largely small and medium-sized businesses, make up the EU tourism industry. And when allied sectors are included, the projected 12.3 million workers employed by these enterprises rise to 27.3 million. In 2018, travel and tourism accounted for around 4% of the GDP of the EU as a whole, or 10% if closely linked sectors are taken into consideration. And due to the pandemic, the tourism industry lost $1 trillion in export income in 2021.

El Shafaki et al. (2024) revealed that the best illustration of the development a Middle Eastern location has undergone is Saudi Arabia. This Kingdom developed a creative tourist plan that supported 1.5 million jobs in 2019 and increased the country's travel and tourism sector by about 15%. By funding massive projects intended to attract both domestic and foreign travellers, this initiative attempts to open the country to the outside world. By providing more visas and adding non-tourist ones as well, the plan concentrates its efforts on increasing both religious and halal tourism. Saudi Arabia expressed its resolve to host 100 million tourists by 2030 and establish itself as a travel hotspot like many smaller countries in the same region.

The success story of Dubai in making itself one of the most attractive tourist destinations, not just in the region but around the world, is cited abundantly. The success attained by Dubai has been studied to identify the factors that contributed to its success. Ricart et al. (2021) have identified the role played by Dubai's swift Visa Application Process (VAP), availability of direct flights from all around the world, a globally competitive network of Hotels, an engaging and attractive shopping experience and availability of a host of tourist attractions collectively contributed towards its success.

Table 1

Literature review on tourism studies and financial development

Study	Dependent Variable	Population	Per Capita GDP	GDP Growth	Exchange Rate	Average Length of Stay	Tourist Air Fare between Destination and	Exports	Government Expenditure	Number of Tourists	Per Capita Real Capital	Per capita real medical tourism	International Tourism Receipts	Financial Development
Ghali (1976)	Rate of growth of total personal income	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Significant (+)	Significant (+)	Significant (+)	Not considered	Not considered	Not considered	Not considered

Study	Dependent Variable	Population	Per Capita GDP	GDP Growth	Exchange Rate	Average Length of Stay	Tourist Air Fare between Destination and	Exports	Government Expenditure	Number of Tourists	Per Capita Real Capital	Per capita real medical tourism	International Tourism Receipts	Financial Development
Diamond (1997)	Tourist arrivals	Significant (+)	Significant (+)	Not considered	Not considered	Not considered	Significant (+)	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered
Law and Choudhry (2015)	Growth in tourist receipts as a share of GDP (tourism	Significant (+)	Not considered	Significant (+)	Significant (+)	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered
Purwomarwanto and Ramachandran (2015)	GDP and hotel rate of occupancy	Not considered	Not considered	Not considered	Significant (+)	Significant (+)	Not considered	Not considered	Not considered	Significant (+)	Not considered	Not considered	Not considered	Not considered
Tang and Abdullah (2018)	Per capita real GDP	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Significant (+)	Not considered	Significant (+)	Significant (+)	Not considered	Not considered	Not considered
Wu and Wu (2019)	Economic growth (real GDP)	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Significant (+)	Not considered
Katircioglu (2009)	Economic growth (real GDP)	Not considered	Not considered	Not considered	Significant (+)	Not considered	Not considered	Not considered	Not considered	Significant (+)	Not considered	Not considered	Not considered	Not considered
Khalil kakar and Waliullah (2007)	real GDP	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Significant (+)	Not considered
Lionetti and Gonzalez (2012)	International trade	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Not considered	Significant (+)	Not considered	Not considered	Not considered	Not considered

Source: Own

Methodological Framework

The aim of this paper is to empirically and, to a clearer extent, understand the role of CO2 emissions, financial development, and the rate of growth of economic activity in tourism in economies that have faced challenges and stagnancies throughout history. It is crucial to highlight the impact on tourist behaviour because of these variables and their contribution as a deciding factor for tourist itineraries.

All the countries fall under the category of emerging and developing countries, and tourism in recent years has increased tenfold throughout the territories. Not only do they attract tourists, but they have also had a significant and positive effect on such economies.

To conduct an effective empirical analysis, we use a panel data set of 123 countries from seven regions from 1999 to 2018 from the World Development Indicators (WDI). The time period under study is limited due to the non-availability of data specifically for developing countries. The dependent variable of the study is the number of tourist arrivals (TOR), while the control variables include financial development (FD), which is measured by an index of financial development; environmental conditions (CC2) are measured by CO_2 emissions, trade openness (TO) showing the extent of indulging in trade in the economy and economic growth measured by Gross Domestic Product (GDP).

A wide perspective model that includes a significant assessment of the effects of the control variables on tourism can be depicted in the following equation:

$TOU = f (FDI_{it}, FII_{it}, FMI_{it}, GDP_{it}, EU_{it}, To_{it}, CO_{2it})$
TOU= No of Tourist Arrivals
GDP= Gross Domestic Product
EU = Energy Uses
TO = Trade openness

The index of financial development used in the study was taken from Svirydzenka ([2016](#)) and Sahay et al. ([2015](#)). The indicators of a Broad-based index of financial development have been adopted from IMF Staff Estimates, Adopted from Wijerathna and Dharmarathna ([2023](#)). In addition to the indices provided in Table 2 of the study conducted by Wijerathna and Dharmarathna ([2023](#)), the authors have used Deposits to GDP ratio, Non-performing loans ratio, Market capitalization of financial institutions to GDP, Government debt to GDP ratio in financial institution index, Financial inclusion index, Financial stability index, Financial literacy index in Financial Markets Depth index.

The study excluded 60 out of 183 countries because of the non-availability of data. Further, researchers incorporated a period from 1980-2019 based on the data availability of the IMF's FD indices.

The indices were constructed using Principal component analysis (PCA). The study is based on seven regions, and the number of countries from each region was selected based on the available data. Therefore, a total of 123 out of 183 countries were considered to reach the results.

Table 2 below represents the number of countries from different regions: 16 in the case of East Asia & Pacific, 20 in Europe & Central Asia, 31 in Latin America & Caribbean, 14 in Middle East & North Africa, 2 in North America, 5 in South Asia and 35 in Sub-Saharan Africa. The researcher incorporated Levin, Lin & Chu (LLC), Im, Pesaran, and Shin W-stat (IPS), ADF Fisher Chi-Square (ADF) and, PP Fisher Chi-Square (PPF) panel unit root tests to ensure the stationarity of the data series included in the investigation.

Results and Discussion

The investigation of panel non-stationarity is crucial as a pre-test for the cointegration analysis. To do so, we apply panel individual unit root tests introduced by Im, Pesaran and Shin ([2003](#)), Fisher-type tests of Maddala and Wu ([1999](#)) and Choi ([2001](#)) using ADF and Phillips–Perron type. The null hypothesis in these tests is non-stationarity.

Table 2

Panel unit Root test

Variable	Assumes Common Unit Root Process	Assumes Individual Unit Root Process		
	LLC	IPS	ADF	PPF
TOU	−27.47* (0.000)	−36.48* (0.000)	1987* (0.000)	587* (0.000)
CO2	−30.08* (0.000)	−42.88* (0.000)	2245* (0.000)	627* (0.000)
FDI	−5.87* (0.000)	−38.24* (0.000)	1895* (0.000)	489* (0.000)
FII	−5.04* (0.000)	−36.54* (0.000)	1624* (0.000)	352* (0.000)
FMI	−3.35* (0.000)	−33.78* (0.000)	457* (0.000)	481* (0.000)
GDP	−1.68* (0.000)	−36.07* (0.000)	1765* (0.000)	217* (0.000)
EU	−2.08* (0.000)	−34.52* (0.000)	1654* (0.000)	274* (0.000)
TO	−3.48* (0.000)	−35.45* (0.000)	1729* (0.000)	389* (0.000)

*The first difference, *, represents a 0.01 significance level*

Table 2 above represents the results of the panel unit root test where probability values are represented in parentheses. The study employed FMOLS, which takes into consideration the econometric issues, including endogeneity, heterogeneity and cross-sectional effects. The study employed DOLS as the dynamic model. Furthermore, Correlation Analysis was employed to reveal the association between CO2 and independent variables.

Table 3

Correlation analysis

Variables	Correlation Coefficient with TOU
CO_2	−0.38*
FDI	0.78*
FII	0.69*
FMI	0.66*
GDP	0.49*
EU	0.61*
TO	0.48*

*represents 0.01 significance level

Table 3 represents the correlation analysis between all the independent variables of the study and the dependent variable, i.e., the number of tourist arrivals. It was observed that the variable CO2 emissions were negatively correlated with the number of tourist arrivals, while all other explanatory variables exhibited a positive correlation with the number of tourist arrivals.

Table 4

CD tests results

CD	Tests Results
Pesaran CD	4.62* (0.000)
Bias-corrected scaled LM	43.89* (0.000)
Pesaran scaled LM	3.89* (0.000)

significant at 1%

Table 5
Residual CD test results

Residual CD	Tests Results
Pesaran CD	6.28* (0.000)
Friedman	42.62* (0.000)
Frees	1.09* (0.000)

A significant at 1%

Table 6
Panel-ARDL Analysis Results

PMG estimator (Long-Run)	
CO2	−0.217* (0.000)
FDI	0.424* (0.000)
FII	0.341* (0.000)
FMI	0.289* (0.000)
GDP	1.204* (0.000)
EU	1.041* (0.000)
TO	0.42* (0.000)

Significant at 1%

Table 7

PMG estimator (Short Run)	
ΔCO2	−0.138*
ΔFDI	0.145* (0.000)
ΔFII	0.254 (0.352)
ΔFMI	0.152* (0.000)
ΔGDP	0.851* (0.000)
ΔEU	0.382* (0.000)
ΔTO	0.032 (0.253)
Hausman test value	2.54 0.451

Significant at 1%

Conclusion

International tourist arrivals and CO_2 emissions were negatively related to each other, clearly depicting that there is a need for eco-friendly policies to promote tourism globally. This study seeks to examine the impact of financial development, CO_2 emissions, trade openness, economic growth and energy use on the

number of tourist arrivals in 123 countries from seven regions of the world i.e. East Asia & Pacific (EAP), Europe & Central Asia (ECA), Latin America & Caribbean (LAC), Middle East & North Africa (MENA), North America (NA), South Asia (SA) and Sub-Saharan Africa (SSA). To conduct an effective empirical analysis, the study used a panel data set of 123 countries from seven regions from 1999 to 2018 from the World Development Indicators (WDI). The panel cointegration results based on FMOLS and DMOLS revealed that there is a long-run relationship between the dependent variable, i.e. tourist arrivals and the independent variables, which include CO2 emissions, Trade openness, energy use and financial development. Financial development is observed to have a positive relationship with tourist arrivals, thus necessitating the focus of financial institutional development in 123 countries selected in the panel.

References

Almeyda-Ibáñez, M., & George, B. (2017). The evolution of destination branding: A review of branding literature in tourism. *Journal of Tourism, Heritage & Services Marketing*, 3(1), 9–17. https://doi.org/10.5281/zenodo.401370

Anser, M. K., Adeleye, B. N., Tabash, M. I., & Tiwari, A. K. (2022). Services trade–ICT–tourism nexus in selected Asian countries: New evidence from panel data techniques. *Current Issues in Tourism*, 25(15), 2388-2403. https://doi.org/10.1080/13683500.2021.1965554

Apleni, L. (2017). Residents' perceptions on urban tourism as a catalyst for economic development: A case study of Buffalo City, South Africa. *African Journal of Hospitality, Tourism and Leisure*, 6(3), 1-12. https://www.ajhtl.com/uploads/7/1/6/3/7163688/article_19_vol_6__3__2017.pdf

Bethapudi, A. (2013). The role of ICT in tourism industry. *Journal of applied economics and business*, 1(4), 67-79. https://www.aebjournal.org/articles/0104/010406.pdf

Blake, A., Sinclair, M. T., & Soria, J. A. (2006). Tourism productivity: evidence from the United Kingdom. *Annals of Tourism Research*, 33(4), 1099-1120. https://doi.org/10.1016/j.annals.2006.06.001

Bohlmann, H. R., & Heerden, J. H. (2008). Predicting the economic impact of the 2010 FIFA World Cup on South Africa. *International Journal of Sport Management and Marketing*, 3(4), 383-396. https://doi.org/10.1504/ijsmm.2008.017214

Brida, J. G., Lanzilotta, B., & Pizzolón, F. (2016). Dynamic relationship between tourism and economic growth in MERCOSUR countries: a nonlinear approach based on asymmetric time series models. *Economics Bulletin*, 36(2), 879–894. https://econpapers.repec.org/RePEc:ebl:ecbull:eb-16-00221

Capó, J., Font, A. R., & Nadal, J. R. (2007). Dutch Disease in Tourism Economies: Evidence from the Balearics and the Canary Islands. *Journal of Sustainable Tourism*, 15(6), 615–627. https://doi.org/10.2167/jost698.0

Cheng, L., & Zhang, J. (2020). Is tourism development a catalyst of economic recovery following natural disaster? An analysis of economic resilience and spatial variability. *Current Issues in Tourism*, 23(20), 2602–2623. https://doi.org/10.1080/13683500.2019.1711029

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance*, 20(2), 249–272. https://doi.org/10.1016/s0261-5606(00)00048-6

Copeland, B. R. (1991). Tourism, welfare and de-industrialization in a small open economy. *Economica*, 58(232), 515. https://doi.org/10.2307/2554696

Endo, K. (2006). Foreign direct investment in tourism—flows and volumes. *Tourism Management*, 27(4), 600–614. https://doi.org/10.1016/j.tourman.2005.02.004

Eusébio, C., Rodrigues, V. M. C. P., Carneiro, M. J., Madaleno, M., Robaina, M., & Monteiro, A. (2023). The role of air quality for reaching tourism environmental sustainability: A segmentation approach based on visitors' pro-environmental behaviors. *International Journal of Tourism Research the International Journal of Tourism Research*, 25(4), 455–473. https://doi.org/10.1002/jtr.2583

Fauzel, S., & Seetanah, B. (2021). Does financial development spur tourism growth? A dynamic time series analysis for the case of an SIDS. *Journal of Policy Research in Tourism, Leisure & Events/Journal of Policy Research in Tourism, Leisure and Events*, 15(1), 52–68. https://doi.org/10.1080/19407963.2021.1919128

Fomum, T. A., & Opperman, P. (2023). Financial inclusion and performance of MSMEs in Eswatini. *International Journal of Social Economics*. https://doi.org/10.1108/ijse-10-2020-0689

Ghali, M. A. (1976). Tourism and Economic Growth: An Empirical study. *Economic Development and Cultural Change/Economic Development and Cultural Change (University of Chicago. Online)*, 24(3), 527–538. https://doi.org/10.1086/450895

Holzer, B., & Millo, Y. (2005). From risks to second-order dangers in financial markets: Unintended consequences of risk management systems. *New Political Economy*, 10(2), 223–245. https://doi.org/10.1080/13563460500144777

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53–74. https://doi.org/10.1016/s0304-4076(03)00092-7

Jaremen, D. E., Nawrocka, E., & Żemła, M. (2020). Externalities of development of the sharing economy in tourism cities. *International Journal of Tourism Cities*, 6(1), 138–157. https://doi.org/10.1108/ijtc-05-2019-0068

Kendall, R. (2012). Climate change as a security threat to the Pacific Islands. *New Zealand Journal of Environmental Law*, 16, 83-116. https://search.informit.com.au/documentSummary;dn=319073555840293;res=IELNZC;type=pdf

Khamrang, L. (2013). Modernisation, Globalisation and Development in Bhutan: Tourism as a Catalyst. *Journal of Management and Public Policy*, 5(1), 5-11. https://www.questia.com/library/journal/1P3-3263319081/modernisation-globalisation-and-development-in-bhutan

Kim, H. J., Chen, M., & Jang, S. (2006). Tourism expansion and economic development: The case of Taiwan. *Tourism Management*, 27(5), 925–933. https://doi.org/10.1016/j.tourman.2005.05.011

Kumar, N., & Kumar, R. R. (2020). Relationship between ICT and international tourism demand: A study of major tourist destinations. *Tourism Economics*, 26(6), 908–925. https://doi.org/10.1177/1354816619858004

Kumar, P., Kumar, V., & Mishra, J. M. (2015). Social media: A tool for tourism marketing. *International Research Journal of Business and Management*, 8(11), 1-6.

Kumar, R. R. (2014). Exploring the role of technology, tourism and financial development: an empirical study of Vietnam. *Quality and Quantity*, 48(5), 2881–2898. https://doi.org/10.1007/s11135-013-9930-5

Kumar, R. R., & Kumar, R. (2013). Exploring the developments in urbanisation, aid dependency, sectoral shifts and services sector expansion in Fiji: a modern growth perspective. *Global Business & Economics Review*, 15(4), 371. https://doi.org/10.1504/gber.2013.056648

Lanza, A., Markandya, A., & Pigliaru, F. (2005). *The economics of tourism and sustainable development.* Edward Elgar Publishing.

Lee, C. (2021). Essays in tourism economics Student thesis: Doctoral Thesis. https://researchportal.port.ac.uk/en/studentTheses/essays-in-tourism-economics

Lee, C., & Taylor, T. (2005). Critical reflections on the economic impact assessment of a mega-event: the case of 2002 FIFA World Cup. *Tourism Management*, 26(4), 595–603. https://doi.org/10.1016/j.tourman.2004.03.002

Lemmetyinen, A., & Go, F. M. (2009). The key capabilities required for managing tourism business networks. *Tourism Management*, 30(1), 31–40. https://doi.org/10.1016/j.tourman.2008.04.005

Li, K. X., Jin, M., & Shi, W. (2018). Tourism as an important impetus to promoting economic growth: A critical review. *Tourism Management Perspectives*, 26, 135–142. https://doi.org/10.1016/j.tmp.2017.10.002

Maddala, G. S., & Wu, S. (1999). A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. *Oxford Bulletin of Economics and Statistics*, 61(S1), 631–652. https://doi.org/10.1111/1468-0084.0610s1631

Madden, G., & Savage, S. J. (2000). Telecommunications and economic growth. *International Journal of Social Economics*, 27(7/8/9/10), 893-906.

Ngoasong, M. Z., & Kimbu, A. N. (2016). Informal microfinance institutions and development-led tourism entrepreneurship. *Tourism Management*, 52, 430–439. https://doi.org/10.1016/j.tourman.2015.07.012

Nguyen, Q., & Nguyễn, C. V. (2022). An analysis of the relationship between ICT infrastructure and international tourism demand in an emerging market. *Journal of Hospitality and Tourism Technology*, *13*(5), 992–1008. https://doi.org/10.1108/jhtt-11-2021-0331

Peterson, R., Cárdenas, D., & Harrill, R. (2014). Tourism as a catalyst for Economic development in Latin America: Setting an agenda for policy and research. *Tourism Analysis*, *19*(1), 117–122. https://doi.org/10.3727/108354214x13927625340433

Pohjola, T., Lemmetyinen, A., & Dimitrovski, D. (2020). Value co-creation in dynamic networks and E-Tourism. In *Springer eBooks* (pp. 1–23). https://doi.org/10.1007/978-3-030-05324-6_92-1

Rasool, H., Maqbool, S., & Tarique. (2021). The relationship between tourism and economic growth among BRICS countries: a panel cointegration analysis. *Future Business Journal*, 7(1). https://doi.org/10.1186/s43093-020-00048-3

Ricart, S., Villar-Navascués, R., & Rico-Amorós, A. M. (2021). Water Exchange and Wastewater Reuse to Achieve SDG 6: Learning from Agriculture and Urban-Tourism Coexistence in Benidorm (Spain). *Clean Water and Sanitation*, 7. https://doi.org/10.3390/books978-3-03897-775-9-1

Sáenz-De-Miera, Ó., & Nadal, J. R. (2014). Modeling tourism impacts on air pollution: The case study of PM10 in Mallorca. *Tourism Management*, *40*, 273–281. https://doi.org/10.1016/j.tourman.2013.06.012

Sahay R, Čihák M, N'Diaye P, Barajas A, BiR, Ayala D, Bi R, Gao Y, Kyobe A, Nguyen L, Saborowski C, Svirydzenka K, Yousefi SR (2015) Rethinking Financial Deepening: Stability and Growth in Emerging Markets (IMF Staff Discussion Notes No. 15/08). International Monetary Fund. Available at https://www.imf.org/external/pubs/ft/sdn/2015/sdn1508.pdf

Shafaki, R. E., Mesbah, N., Maxim, C., & Morrison, A. M. (2024). Sustainable urban tourism in MENA countries. In *Edward Elgar Publishing eBooks* (pp. 496–513). https://doi.org/10.4337/9781803926742.00047

Sheng, L., & Tsui, Y. (2009). A general equilibrium approach to tourism and welfare: The case of Macao. *Habitat International*, *33*(4), 419–424. https://doi.org/10.1016/j.habitatint.2009.01.002

Sheng, L., & Zhao, W. (2016). Strategic destination management in the face of foreign competition: the case of Macao SAR. *Journal of Travel & Tourism Marketing*, *33*(2), 263–278. https://doi.org/10.1080/10548408.2015.1051198

Spasojević, B., Lohmann, G., & Scott, N. (2018). Air transport and tourism – a systematic literature review (2000–2014). *Current Issues in Tourism*, *21*(9), 975–997. https://doi.org/10.1080/13683500.2017.1334762

Svirydzenka, K. (2016). *Introducing a new broad-based index of financial development.* International Monetary Fund.

Torrent-Sellens, J., Ficapal-Cusí, P., Boada-Grau, J., & Vigil–Colet, A. (2015). Information and communication technology, co-innovation, and perceived productivity in tourism small and medium enterprises: an exploratory analysis. *Current Issues in Tourism*, *19*(13), 1295–1308. https://doi.org/10.1080/13683500.2015.1029878

Van Der Sterren, J. (2008). Financial markets, microfinance and tourism in developing countries. *ARA Journal of Tourism Research*, *2*(4), 35–44. https://dialnet.unirioja.es/servlet/articulo?codigo=6852906

Van Truong, N., & Shimizu, T. (2017). The effect of transportation on tourism promotion: Literature review on application of the Computable General Equilibrium (CGE) Model. *Transportation Research Procedia*, *25*, 3096–3115. https://doi.org/10.1016/j.trpro.2017.05.336

Wijerathna, & Dharmarathna. (2023). Effect of the financial development on carbon emission: An empirical investigation from a global perspective. *Journal of Accountancy & Finance*, *10*(1), 1-18. https://doi.org/10.57075/jaf1012301