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Fiscal decentralization, energy security, economic growth, and tourism nexus: Evidence from big six economies

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ABSTRACT

The travel and tourism industry contributes significantly to economic growth, global connectivity, and quality of life. We investigate the relationship between fiscal decentralization, energy security, economic growth, and tourism for the leading-six economies (namely China, France, Germany, Japan, the UK, and the USA) from 1995 to 2018 and examine the existence of the Kuznets curve (KC) between TR and FDC. Feasible generalized least squares (FGLS) and Panel corrected standard errors (PCSE) are employed for empirical examination of the liaison between the said variables. In the leading six economies, we find evidence for the N-shaped Kuznets curve. Fiscal decentralization (FDC), economic growth (EG), and energy security (ES) promote tourism. Other controls, such as tourism development and urbanization, are also included in the core model to check the robustness of the results. Our findings are insensitive to the integration of the other controls and econometric models. We find a positive relationship between urbanization, tourism development, and tourism, emphasizing the importance of tourism development and urbanization. The policy implication is that the top six economies can achieve sustainable growth in tourism by decentralizing their fiscal policies, boosting their economic growth, and ensuring their energy securities.

Contribution/Originality: This study contributes to the body of knowledge in two ways: (1) a nonlinear strategy suggesting an N-shaped connection between FDC and tourism; and (2) the impact of energy security and economic growth on tourism in the Big Six economies. This study adds to the FDC-tourism nexus and ES-tourism nexus literature.

1. INTRODUCTION

The allocation of power and duties among different tiers of government has been the subject of considerable academic and policy interest. In particular, the delegation of power to local governments to collect tax revenues and spend public funds has been a topic of debate in both academia and politics (Rodríguez-Pose & Gill, 2003), as the manner in which fiscal authority is allocated among various tiers of government affects EG, government efficiency,

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and political representation and participation. Fiscal decentralization (FDC) refers to the distribution of authority and responsibilities between the various levels of government to collect revenues and spend public funds. It is viewed as a strategy that encourages policymaker's participation in decision-making, transparency, and accountability. Increased fiscal autonomy under FDC encourages local governments to use available resources according to their own preferences (Schaltegger & Küttel, 2002; Wang, Zheng, & Zhao, 2012).

Some existing literature has explored the relationship between FDC and income inequality and has arrived at mixed conclusions (Cavusoglu & Dincer, 2015; Ezcurra & Pascual, 2008; Liu, Martinez-Vazquez, & Wu, 2017; Sacchi & Salotti, 2014; Tselios, Rodríguez-Pose, Pike, Tomaney, & Torrisi, 2012). Other empirical literature on FDC focused on the effects of FDC on EG (Akai & Sakata, 2002; Baskaran & Feld, 2013; Davoodi & Zou, 1998; Feltenstein & Iwata, 2005; Filippetti & Sacchi, 2016; Iimi, 2005; Martínez-Vázquez, Lago-Peñas, & Sacchi, 2017; Rodríguez-Pose & Ezcurra, 2011; Stansel, 2005; Thornton, 2007; Xie, Zou, & Davoodi, 1999; Zhang & Zou, 1998), while a few have investigated the link between FDC and public sector efficiency in terms of improved educational attainment (Barankay & Lockwood, 2007) health care systems (Porcelli, 2014) and the delivery of education and health care services (Adam, Delis, & Kammas, 2014).

These empirical studies have, however, ignored the broader and urgent issue of the impact of FDC on sustainable development and the tourism sector, which has experienced rapid growth over the last two decades. While global tourism has become one of the greatest EG drivers, the expansion of the tourism industry has generated new employment opportunities, new sources of income, and increased tax revenue. In 2019, the travel and tourism industry contributed 10.3% to the global gross domestic product (GDP). This share decreased by 5.3% in 2020 due to the COVID-19 restrictions (Zeng, Gao, Shen, Ma, & Li, 2020). In 2018, there were 1.4 billion international tourists, of whom 60% visited the Organization of Economic Cooperation and Development (OECD) countries. According to the WTTC (2020), the tourism sector contributed approximately 10.4% of global GDP and 9.9% of global employment in 2017. According to estimates, there were 1,186 million international tourist arrivals in 2015, generating US$1.5 trillion in tourism export revenue. 10% of the global GDP in 2015 was attributed to tourism-related sectors. According to the WTTC (2020), the Maldives was the first country to obtain 37.5% of its GDP from tourism. Macao earned 36.5% and was ranked second. Tourism has become a significant contributor to China's EG due to the country's rising standard of living and economic development. It is anticipated that tourism will increase by an average of 43 million per year to reach 1.8 billion foreign tourist arrivals by 2030, which would represent a sevenfold increase since 1970 (OECD, 2018).

Oates (1972) described the seminal work on decentralization as follows: "Each public service should be delivered by the authority with jurisdiction over the smallest geographic area that would internalize the benefits and costs of such provision." With FDC, current expenditures and revenue burdens are shifted to local governments that can promote inbound and outbound tourism. FDC promotes tourism (Zeng et al., 2020), and the Local government derives the majority of its revenues from tourism, which contributes to EG (Chen et al., 2020). FDC increases the proportion of local government expenditure and revenue and provides a solid framework for EG (Oates, 1999). It can stimulate tourism and ultimately stimulate EG (Martinez-Vazquez & McNab, 2003). Chen et al. (2020) found that FDC creates competition among domestic tourism-performing regions. While tourism contributes to the unequal distribution of income, FDC reduces the income gap and increases tourism. Regional economic development is the primary criterion by which higher-level officials evaluate lower-level officials, encouraging local officials to priorities local economic development through tourism management. Local authorities implement policies favorable to all economic sectors, including tourism and urbanization. They invest more effectively and lavishly in tourism development than the federal government, at least in the context of FDC. As an example, China's 1994 tax-sharing reform established a framework for FDC that separated the fiscal and expenditure authority of the central and local governments. China's tourism opportunities and EG have increased due to FDC (Zuo & Huang, 2018).

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FDC promotes urbanization and tourism, thereby reducing the rural-urban income gap (Zhang, 2023a). With urbanization, the income gap between urban and rural areas widens as the urban populations' levels of education go up, increasing employment prospects, the abundance of public amenities, and wealth (Chen et al., 2020). Urbanization also has a direct effect on household income, which influences travel demand. It also causes the concentration of economic resources in cities where productivity is higher. Thus, Local governments are motivated and obligated to ensure impartiality through transfer payments as a result of FDC reforms.

As a system of institutionalized public governance, FDC finds it challenging to fulfill its mandate on its own capabilities, which must rely on the actions of all participants to foster tourism by considering the dual incentives between economics and politics, "the principal-agent theory," the local government constraint mechanism, and the assumptions of "political man" and "rational economic man" (Cai et al., 2022). Through the interaction of national and subnational governance, FDC creates investment opportunities among firms at the lowest cost, thereby increasing growth (Oates, 1972).

Numerous studies on FDC and other social, economic, and environmental issues at the national and subnational levels have been conducted. It has recently brought the debate over FDC versus local governments to the attention of academics, lawmakers, and researchers. This current study focuses on how much the government pays for tourism-related expenses within the framework of FDC. The main question relevant to this research is: Will FDC have an impact on the development of tourism? The main objective of the study is to examine the impact of FDC on tourism in six big fiscally decentralized economies (namely, the United States, the United Kingdom, Germany, France, Japan, and China). This study contributes to the body of knowledge in two ways: (1) a nonlinear strategy suggesting an N-shaped connection between FDC and tourism; and (2) the impact of FDC, Energy security, and economic growth on tourism in the Big Six economies. This study adds to the FDC-tourism nexus and ES-tourism nexus literature. Due to the high degree of FDC in these economies, a panel of high-income and emerging countries has been chosen.

The remainder of this study is structured as follows: The "literature review" is presented in Section 2, and the methodology is explained in Section 3. The "Empirical Results and Discussion" are presented in Section 4. The "Conclusions and Policy" suggestions are presented in Section 5.

2. LITERATURE REVIEW

A significant body of literature reflects the growing interest in the link between tourism and the FDC; however, very limited studies have attempted to examine the relationship between the FDC and tourism. There has been discussion regarding whether centralization or decentralization is more beneficial to the enhancement of tourism opportunities. This article creates the first all-encompassing study framework based on tourism and FDC, in contrast to previous research. Moreover, existing studies have empirically examined the relationship between tourism and important social, economic, environmental, and other variables not related to FDC.

Zeng et al. (2020) argued that GDP has a positive impact on tourism revenue. In their study of FDC and health outcomes, Cantarero and Pascual (2008) found a positive association between FDC and infant health outcomes and male and female life expectancy. Shi et al. (2020) investigated the relationship between tourism, primary energy consumption, CO_2 emissions, and EG for a panel data set of developed, developing, and low-income nations. The result indicates that tourism, primary energy consumption, and EG are cointegrated in the sample of developing countries.

Examining the relationship between tourism and urban-rural income disparity, Kim and Kang (2020) found that tourism exacerbates rural-urban income disparities. Feng, Wei, Zhang, and Gu (2018) and Gao and Wu (2017) examined whether tourism can reduce poverty alleviation by providing employment opportunities to the indigent and allowing them to utilize indigenous natural resources. The results demonstrated conclusively that FDC at the local or village level improved tourism. Gao, Huang, and Huang (2009) determined empirically that the Chinese

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government plays a crucial role in reviving rural tourism through the implementation of favorable policies. The decisive policies supported the dominance of FDC in the tourism industry.

Using a panel data set from developing economies, Chi (2021) validated the N-shaped link between tourism and income inequality. This means that as tourism grows, income inequality initially increases, then decreases, and then increases. Chi (2021) observed that tourism and inequality exhibit a "relink effect" based on the conventional EKC. Thus, an N-shaped or inverted N-shaped curve may occur. Therefore, by incorporating the square and cube terms of tourism into the model, the nonlinear relationship must be further investigated under different conditions. Using data from 1995 to 2013, Zuo and Huang (2018) found an N-shaped relationship between tourism and EG in 31 Chinese provinces. Several determinants of the N-shaped curve are explained below.

Grossman and Krueger (1991) proposed the environmental Kuznets curve (EKC), which depicts EG and environmental degradation as an inverted U. However, there is an N-shaped EKC, which suggests that the original EKC hypothesis will fail over time. Thus, beyond a certain income threshold, EG tends to positively affect environmental degradation (De Bruyn, Van Den Bergh, & Opschoor, 1998). The N-shaped relationship, according to Torras and Boyce (1998), occurs when the scale effect outweighs the composition and technical effects. This may be the result of fewer opportunities to improve the distribution of industries or diminishing returns on technological change (Lorente & Álvarez-Herranz, 2016; Torras & Boyce, 1998). Grossman and Krueger (1995) posit that the presence of an N-shaped EKC can be attributed to three distinct factors: technology, structure, and scale. On the basis of these three effects, the N-shaped EKC curve connecting income and environmental degradation is constructed. Balsalobre-Lorente, Driha, and Sinha (2020) analyzed the N-shaped curve of tourism and per capita income growth for a panel of selected OECD countries from 1994 to 2014. The analysis incorporated the impacts of per capita CO2, globalization, and energy use. The Generalized Method of Moments (GMM) analysis provided support for the N-shaped relationship between global tourism and per capita income growth.

Zhang (2023b) examined the impact of tourism on income inequality from 1995 to 2018 using a panel dataset of provinces in China. By examining the nonlinear effects of tourism on urban-rural income inequality and rural income inequality using a dynamic panel approach, he established a significant correlation between domestic tourism and rural income disparity. Nonetheless, there was a discernible link between rural income inequality and tourism. Moreover, domestic or international tourism, as well as urban-rural economic disparity, exhibited N-shaped KC. In the eastern, central, and western regions, the impact of tourism on rural income disparity and urban-rural income inequality varied considerably, according to the study.

Using China's provincial panel data between 1995 and 2019, Zhang (2023b) found that tourism and urbanization exacerbate urban income disparity. In addition, urban income disparity and tourism exhibit the KC link. When the ratio of tourism revenue to GDP reaches 0.416%, the magnitude of tourism's positive impact on urban income inequality is at its peak. Tourism has a positive effect on urban income inequality in the majority of China's provinces. In addition, urbanization moderates the effect of tourism on urban income disparity. Most studies have proven the N-shaped curve for tourism and other variables, including population (Allard, Takman, Uddin, & Ahmed, 2018; Grossman & Krueger, 1991, 1995).

Using panel data from 46 economies between 1970 and 1989, Davoodi and Zou (1998) found that FDC has a negative impact on EG in developing countries. However, using the local government's proportion of total government spending to capture FDC in this study may not have adequately captured the crucial role that decentralization plays in encouraging spending on investments. Pasichnyi, Kaneva, Ruban, and Nepytaliuk (2019) found that FDC has a mixed effect on economic development. Regarding fiscal revenue, the impact is negative for some European Union countries. On the other hand, as far as fiscal expenditure is concerned, FDC has a positive effect on economic development. Empirical investigations have also revealed that FDC in both revenue and expenditure stimulates EG (Canavire-Bacarreza, Martinez-Vazquez, & Yedgenov, 2020; Chen et al., 2020). Analyzing the relationship between FDC and EG in 21 OECD countries between 1990 and 2005, Rodríguez-Pose and Ezcurra

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(2011) found a weak and significant link between FDC and economic development. Baskaran and Feld (2013) and Gemmell, Kneller, and Sanz (2013) found that FDC has an inhibitory effect on EG. The inhibitory effect of FDC on EG has also been supported by Canavire-Bacarreza et al. (2020) and Zhang and Zou (1998). However, Woller and Phillips (1998) found an inconclusive relationship between FDC and EG in a sample of LDC.

Cai et al. (2022) conducted a study on FDC and environmental degradation in China's regions. They assessed how local government conduct under FDC contributes to environmental degradation in the study. The paper empirically evaluates the effect of FDC on environmental pollution using data from Chinese prefecture-level cities between 2014 and 2018. To quantify environmental pollution, PM2.5 concentrations and SO_2 emissions are used. The effects of Chinese-style FDC on the environment vary based on the degree of economic and cultural integration in the region. Slavinskaitė (2017) found no association between FDC and economic development in highly developed countries, whereas there was a positive association in low-income countries. These results indicate that FDC is not always a tool for promoting EG, suggesting that the level of economic development of a nation is a crucial factor to consider when proposing reforms that include FDC.

Zeng et al. (2020) analyzed data from 30 Chinese provinces from 2000 to 2018 to see how local governments affect the growth of tourism in China. They found that FDC in China encourages local governments to build up big state-owned businesses and industries that pollute, which are not good for the long-term growth of tourism. In addition, pollution levels and tourism development exhibit an "inverted U-shaped" relationship. Using a panel co-integration model, Chen et al. (2020) analyzed the dynamic link between FDC, income gap, urbanization, and tourism growth in China from 1993 to 2018. The findings showed a co-integration relationship between FDC, income disparities, and tourism growth. Also, they found a heterogeneous impact of FDC and income disparities on regional tourism development.

These empirical studies have ignored the broader and increasingly urgent issue of the impact of FDC on sustainable development and the tourism industry, which has experienced rapid expansion over the past two decades. To the best of our knowledge, only Chen et al. (2020) and Zeng et al. (2020) have conducted a study demonstrating that FDC and tourism have a non-linear effect on income inequality and not even the effect of FDC on tourism. Therefore, there is a research gap when it comes to the effect of FDC on tourism. This study will empirically test the N-shaped relationship between FDC and tourism development.

3. RESEARCH METHODOLOGY

It is tactical to conclude that there exists a nonlinear association between FDC and tourism based on the theoretical and empirical analyses of Lv, Pang, and Doğan (2022) and Zhang (2023b).

3.1. Model Specification

Given the theoretical and empirical analyses of Allard et al. (2018), Grossman and Krueger (1991), Zhang (2023b), and Cai et al. (2022), it is logical to infer a nonlinear association between FDC and tourism as well as other control variables. Following above-mentioned studies that examined the potential for nonlinear impacts of FDC on tourism, it is suggested that FDC and tourism might be the conduits for the nonlinear effects. To ensure that the model's specifications and findings are comparable to previous empirical research on FDC's effects on tourism, the nonlinear model formulation was used in this empirical work.

The current study uses panel data to explore the impact of FDC on international tourist arrivals in the big six economies. Following Allard et al. (2018) and Grossman and Krueger (1991), the core panel data model of this study, which shows the relationship between tourism and FDC, is as follows:

$$LITA_{it} = \alpha_{it} + \alpha_1 FDC_{it} + \alpha_2 FDC^2{}_{it} + \alpha_3 FDC^3{}_{it} + \alpha_{4i} X_{it} + \varepsilon_{it} \quad (1)$$

The dependent variable LITA in Equation 1 represents tourism as calculated from the log of international tourist arrivals. The core independent variable is FDC, with FDC^2 and FDC^3 representing non-linearity of FDC. The P-

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value of the coefficients has not changed, despite the fact that the quadratic and cubic terms may be the cause of multicollinearity in this case. X_{it} is the vector of control variables in the model, including tourism development (TD) and urbanization. The subscript *i* represents nations (i.e., leading economies), and *t* represents time (i.e., 1995-2018). The coefficient α_{it} captures the average effect on LITA when FDC has no influence, other αs capture the direction and importance of other exogenous variables, and ε_{it} is the disturbance. KC will adopt various forms (i.e., U-shaped, inverted U-shaped, N-shaped, and inverted N-shaped) depending on the signs of α linked with EG (Allard et al., 2018; Farooq, Ul-Haq, & Cheema, 2023; Lorente & Álvarez-Herranz, 2016; Ul-Haq, Visas, Umair, Hussain, & Khanum, 2023).

To explore the effect of FDC, EG, energy consumption (CBTU), energy production (PBTU), and energy security (ES) on international tourist arrivals in the big six economies, the study performed some diagnostic tests, including the Modified-Wald test to detect hetero-scedasticity, the Wooldridge test to check the issues of serial correlation, and the Breusch-Pagan (BP) LM CD test. By using the above-mentioned tests, the problems of hetero-scedasticity, autocorrelation, and cross-sectional dependence (CD) in the three models are tested. The panel diagnostics tests identified these issues, which can be addressed by using Feasible Generalized Least Squares (FGLS) and Panel Corrected Standard Error (PCSE). Since *T* is larger than *N*, the most suitable method is the FGLS (Armeanu et al., 2018; Beck & Katz, 1995; Davidson & MacKinnon, 1993; Hoechle, 2007; Le, Le, & Taghizadeh-Hesary, 2020; Lenka & Bairwa, 2016; Maddala & Lahiri, 2009; Sarkodie & Strezov, 2019).

3.2. Data Sources and Variable Explanations

The study uses panel data from the leading six economies, namely China, France, Germany, Japan, the UK, and the USA, for the period 1995-2018[1] to examine how FDC, economic growth, energy (i.e., energy consumption, production, and ES), and tourism development affect tourism.

A tourism indicator is measured by the log of international tourists' arrivals, a commonly used proxy for tourism in the literature (Amin, Kabir, & Khan, 2020; Sarpong, Bein, Gyamfi, & Sarkodie, 2020; Ul-Haq, Imran, Oad, & Visas, 2023; Visas et al., 2023). The data is taken from World Development Indicator (WDI) dataset of the World Bank.

FDC is the core variable, and it shows how much influence local governments have in deciding to spend money. According to the traditional theory of FDC, the transfer of fiscal authority and responsibility from the national to subnational levels of government is connected to four main interrelationships, namely: 1) the ability to make expenditure decisions; 2) the ability to levy taxes and raise revenue; 3) the ability to transfer money between government levels; and 4) the ability to borrow on the subnational level. There are no reliable signs of FDC. It may be described from the perspectives of fiscal spending (Liu & Ma, 2016), fiscal revenue (Wu & Heerink, 2016), and marginal revenue at the local level obtained from budgetary revenue (Lin & Liu, 2000). Aside from fiscal spending and revenue decentralization indicators, some scholars have also used other proxies, including the financial share ratio at the national and subnational levels and tax administration decentralization. The use of fiscal spending in the estimation of FDC is acknowledged as appropriate. In order to reflect this, FDC, as the expenditure decentralization indicator used here, is the ratio of per capita national fiscal spending to per capita provincial fiscal expenditure. Data on FDC is derived from IFS-IMF[2].

Energy is considered a key promoter of tourism (Becken, 2002; Becken, Frampton, & Simmons, 2001; Becken & Simmons, 2002; Becken, Simmons, & Frampton, 2003; Bode, Hapke, & Zisler, 2003; Gössling, 2000, 2002; Tabatchnaia-Tamirisa, Loke, Leung, & Tucker, 1997; Visas et al., 2023). Following Thai-Ha Le and Nguyen (2019), ES is measured as the ratio of energy production (in BTU) to energy consumption (in BTU). The energy-related variable data measured in BTU (British thermal unit) is derived from the US Energy Information Administration

[1] This period selection is based on the availability of key variables.

[2] IFS-IMF represent international financial statistics (International monetary fund)

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(EIA). A panel data model is developed in which tourism is used as the dependent variable. For economic growth (EG), following Kalaitzi and Chamberlain (2021), we used log GDP (constant 2015 USD). Tourism development (TD) is used as a control variable in the model. It indicates the tourism development or penetration in the sample countries. Following Gnangnon (2020) and Wu and Wu (2018), tourism receipts as a share of GDP (a proxy for tourism development indicator) are used as one of the control variables. The tourism development data is taken from the WDI data base.

Following C. Zhang and Lin (2012), Shahzad, Ferraz, Doğan, and Do Nascimento Rebelatto (2020), and Adewuyi and Awodumi (2016), urbanization is used as a control variable in this study. Urbanization is measured as the share of urban population in the total population. In addition to the United Nations' (UN) definition, which states that urbanization is the percentage of the population that lives in urban areas, there are several definitions of urbanization that take demographic, economic, topographical and social viewpoints into account. The urbanization data is taken from WDI dataset.

4. EMPIRICAL RESULTS AND DISCUSSION

The empirical result of this study is based on variable statistics and proposed econometric techniques.

4.1. Descriptive Statistics

Table 1 contains the descriptive statistics for the variables included in the empirical analysis. It displays the average, standard deviation (SD), minimum, and maximum values of the variables utilized in this study.

Table 1. Descriptive statistics.

Variables	N	Mean	SD	Min.	Max.
LITA	137	17.620	1.158	15.023	19.172
FDC	133	0.335	0.173	0.045	0.526
EG	144	29.072	0.704	28.202	30.601
CBTU	144	39.971	40.852	8.229	147.02
PBTU	144	28.990	35.770	1.352	117.82
Urban	144	74.112	14.281	30.961	91.616
ES	144	0.592	0.298	0.066	1.206
TD	106	0.013	0.008	0.001	0.029

4.2. Estimates of Core Model

Two tests, the Modified-Wald test for group-wise heteroscedasticity in the FE model and the Wooldridge test for serial correlation, are shown in Table 2. The chi square of the Modified Wald test and the F statistics of the Wooldridge test are significant at the 1% level, confirming the existence of heteroscedasticity and serial autocorrelation, respectively.

Table 2. Panel diagnostics.

Test	1	2	3
Modified Wald (χ^2)	4433.86*** (0.000)	1427.70*** (0.000)	11583.16*** (0.000)
Wooldridge test	43.632*** (0.000)	34.949*** (0.002)	34.536*** (0.002)
BP-LM test	16.503 (0.349)	47.977*** (0.000)	40.463*** (0.000)

Note: *** shows 0. 01 significance level.

Considering the above issues, the FGLS model is better for analysis that examines the effect of FDC, EG, and energy measures on LITA. Table 3 shows the empirical estimates of FGLS and PCSE methods. α_1 has a positive-sign

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for all models (i.e., FGLS and PCSE). The sign of α_2 is negative for all models, whereas α_3 is positive for all models. We can conclude, depending on the signs of the αs linked with FDC, that there is an N-shaped KC liaison between FDC and LITA for this sample of the six largest economies. This conclusion is in line with Lorente and Álvarez-Herranz (2016) and Allard et al. (2018). The coefficients of FDC and its square and cubic terms are statistically significant and positive, negative, and positive, respectively. In other words, tourism tends to increase, decrease, and then increase as FDC continues to develop. You can get an N-shaped KC when the scale effect cancels out the technical and composition effects (De Bruyn et al., 1998; Lorente & Álvarez-Herranz, 2016; Mikayilov, Mukhtarov, Mammadov, & Aliyev, 2020; Torras & Boyce, 1998).

Similarly, the importance of economic development for the tourism sector cannot be ignored (Amin et al., 2020). The findings demonstrated that the tourism sector benefits from EG. The growth-led tourism hypothesis demonstrated in this study has been backed by Lee and Chang (2008); Balaguer and Cantavella-Jorda (2002), Durbarry (2004), Gunduz and Hatemi-J (2005), Carrera, Brida, and Risso (2008), Carrera et al. (2008), Chen and Chiou-Wei (2009), Akinboade and Braimoh (2010), and Tang and Abosedra (2014).

In addition, the findings show that energy is one of the key factors influencing tourism because it depends solely on energy production and consumption, whereas ES is advantageous to the sector (Amin et al., 2020). In light of these developments for both EG and energy, the tourism sector grows strongly. The current findings are robust and are insensitive to the choice of econometric models.

4.3. Robustness Checks

The core model was expanded with urbanization (Urban) and tourism development (TD), which are commonly used in the literature as major factors that affect LITA. This was done to see how stable the current results were. In addition to including these major determinants in the core model, we test the robustness of the extended model using the PCSE econometric strategy. Table 4 displays the results of these examinations. Table 4 shows that the results about the presence of N-shaped KC in the top six countries stay the same even after these factors are added to the main model. The finding of FDC's nonlinear impact demonstrates that domestic tourism can be well managed by reinforcing FDC as it contributes to tourism growth. FDC stimulates tourism, and these findings are reliable and insensitive to various estimation methods. The empirical findings are consistent with (Chen et al., 2020) and contradict (Zeng et al., 2020). According to Su, Umar, and Khan (2021), higher FDC provides local governments with more budgets and makes it easier for them to make investments in renewable energy that encourage the use of renewable energy and reduce the use of nonrenewable energy.

The current findings support the existence of economic-led tourism growth hypothesis like Narayan (2004), Oh (2005), Paramati, Alam, and Lau (2018), and Tang and Jang (2009). Similar to Amin et al. (2020), this study also reveals that energy is a key factor in determining tourism, as it has a positive impact on the tourism sector of the countries under consideration, and ES is advantageous for the development of the tourism sector. The results are robust and insensitive to the control variables (Urban and TD) used in the analysis. In summary, there is evidence of N-shaped KC in the sample of the six leading economies. FDC continues to increase the number of international tourists. All models demonstrate statistical significance for this effect. Elheddad, Djellouli, Tiwari, and Hammoudeh (2020) argued that FDC has a non-linear relationship with energy consumption in 31 Chinese provinces.

Urbanization emerged as a significant societal phenomenon between the 19th and 20th centuries, with far-reaching implications for the social structures and geography of human communities. However, Urbanization has received limited attention in the literature on tourism and hospitality. Urbanization occurs naturally as a result of corporate and individual efforts to reduce the time and expense of commuting and public transportation while simultaneously expanding opportunities for employment, education, housing, and transportation. It has been demonstrated that urbanization contributes positively to tourism in all models. The growth of urban areas promotes LITA (Chen et al., 2020).

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Table 3. FDC, ES, EG and TR in B6 economies.

Variables	FGLS				PCSE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FDC	49.462***	67.904***	67.006***	77.433***	51.470***	69.886***	68.559***	81.677***
	(3.820)	(2.626)	(2.349)	(2.643)	(4.376)	(3.325)	(2.999)	(2.884)
FDC^2	-185.167***	-286.073***	-276.961***	-307.881***	-208.611***	-301.575***	-289.637***	-320.286***
	(20.929)	(13.587)	(12.321)	(11.781)	(23.664)	(17.086)	(15.900)	(13.459)
FDC^3	190.720***	318.740***	305.127***	334.046***	232.467***	340.857***	323.357***	345.907***
	(28.259)	(17.648)	(16.075)	(14.687)	(31.870)	(21.988)	(20.665)	(17.274)
EG		0.515***	0.429***	0.9818***		0.666***	0.514***	0.867***
		(0.159)	(0.122)	(0.073)		(0.247)	(0.199)	(0.100)
CBTU		0.016***				0.015***		
		(0.003)				(0.004)		
PBTU			0.020***				0.020***	
			(0.002)				(0.003)	
ES				1.503***				2.183***
				(0.195)				(0.258)
Constant	15.041***	-0.562	1.889	-15.472***	15.034***	-4.907	-0.547	-13.017***
	(0.156)	(4.590)	(3.525)	(2.037)	(0.181)	(7.106)	(5.737)	(2.744)
F/Wald-stat.	955.41	1722.24	2261.65	2121.47	436.22	1359.11	1755.88	1643.03
P-values	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	126	126	126	126	126	126	126	126

Note: LITA is the dependent variable in above models. Standard errors in parentheses. *** shows p<0.01.

Table 4. FDC, ES, EG and TR in B6 economies (Robustness check).

Variables	FGLS				PCSE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FDC	49.462***	33.546***	35.867***	38.537***	51.470***	36.039***	37.761***	35.627***
	(3.820)	(2.985)	(3.106)	(5.859)	(4.376)	(3.220)	(3.375)	(6.625)
FDC^2	-185.16***	-129.864***	-137.376***	-145.22***	-208.611***	-144.117***	-149.85***	-144.17***
	(20.929)	(14.467)	(14.495)	(19.401)	(23.664)	(15.841)	(15.959)	(21.724)
FDC^3	190.720***	140.466***	147.596***	154.551***	232.467***	158.679***	164.101***	158.925***
	(28.259)	(17.685)	(17.611)	(20.566)	(31.870)	(19.485)	(19.525)	(22.799)
EG		0.744***	0.704***	1.138***		0.807***	0.859***	1.309***
		(0.265)	(0.245)	(0.154)		(0.305)	(0.283)	(0.170)
CBTU		0.010**				0.009*		
		(0.005)				(0.005)		

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Variables	FGLS				PCSE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PBTU			0.012** (0.005)				0.009 (0.006)	
ES				0.466 (0.462)				0.007 (0.283)
TD		145.519*** (7.308)	136.944*** (7.972)	140.87*** (9.111)		136.744*** (0.283)	130.189*** (8.829)	137.259*** (10.226)
Urban		0.041*** (0.007)	0.042*** (0.007)	0.039*** (0.008)		0.040*** (0.007)	0.039*** (0.008)	0.028*** (0.009)
Constant	15.041*** (0.156)	-11.576 (7.085)	-10.537 (6.48)	-23.127*** (3.273)	15.034*** (0.181)	-13.161*** (8.179)	-14.514* (7.514)	-26.395*** (3.575)
F/Wald-stat.	955.41	3180.88	3087.97	1362.08	436.22	3088.07	3005.82	3012.27
P-values	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	126	92	92	92	126	92	92	92

Note: LITA is the dependent variable in the above models. Standard errors in parentheses. *** shows p<0.01, ** shows p<0.05, and * shows p<0.1.

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TD and LITA are associated (Adeola & Evans, 2020). TD leads to a rise in tourism in the sampled countries. Luo, Qiu, and Lam (2016) found that urbanization generates opportunities for tourism in rural areas of China. The findings of Luo, Zhang, Lam, and Goh (2013) at the province level indicate that urbanization is a significant factor for the growth of domestic tourism in China but not for the growth of foreign tourists. By establishing the influence of urbanization on tourist (LITA) in the panel dataset, this study advances the body of knowledge in the field of hospitality and tourism. In general, the effects of urbanization on the growth of the tourist industry will vary by area. However, the study contributes to the body of knowledge on the growth of tourism and hospitality by providing empirical findings to comprehend the connection between urbanization and tourist arrivals. The significant positive relationship between urbanization and tourism, which is in line with the findings of He, Zhou, and Huang (2016) and Luo et al. (2016), demonstrates the progress of urbanization in these six economies. Also, He et al. (2016) found that FDC also increases urbanization.

5. CONCLUSION AND POLICY RECOMMENDATIONS

The tourism sector makes a significant contribution to economic development, international relations, and the raising of living standards. This study investigates the existence of the Kuznets curve in the relationship between FDC and tourism in China, France, Germany, Japan, the United Kingdom, and the United States from 1995 to 2018. Evidence of an N-shaped KC is observed in these six largest economies. Based on these findings, it appears that the initial inverted U hypothesis may or may not maintain its validity over time. An N-shaped EKC occurs when the scale effect outweighs the technical and composition effects. In our sample countries, FDC contributes to the growth of tourism. This conclusion is reliable and unaffected by the econometric model. The results indicate that tourism benefits from economic expansion. Due to its reliance on energy production and consumption, energy is one of the most influential factors in the tourism industry, and ES is essential for the sector's growth. Because of these developments in economic expansion and energy, the tourism industry is experiencing significant growth. In order to provide a robust check, we added urbanization and tourism growth. Our results are unaffected by the integration of the control variables, as the main variables remained significant and maintained the expected signs. The research establishes a positive relationship between urbanization, tourism development, and tourism.

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Authors' Contributions: The conceptualization was done, J.H. and S.M.; data was collected, reviewed & edited, J.H. and H.V.; data arranged and transformed into Stata formed, J.H., Q.M.A.H. and H.V.; finalized the methodology for analysis and analysis, J.H., H.V. and R.R.; wrote the original draft, S.M. and H.V.; improved the draft, R.R. and Q.M.A.H.; supervised the whole study, J.H. All authors have read and agreed to the published version of the manuscript.

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