Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVII, vol. 54, no. 2spl, 2024, p.784-793
DOI 10.30892/gtg.542spl02-1253

IS VIETNAM'S TOURISM DEMAND MODEL COMPATIBLE WITH THE EXTENDED GRAVITY MODEL?

Phuong Nu Minh LE*
University of Economics, Hue University, Faculty of Economics and Development Studies, Planing and Investment Department, Hue City, Vietnam, e-mail: lenuminhphuong@hueuni.edu.vn

Citation: Le, P.N.M. (2024). IS VIETNAM'S TOURISM DEMAND MODEL COMPATIBLE WITH THE EXTENDED GRAVITY MODEL? *Geojournal of Tourism and Geosites*, 54(2spl), 784–793. https://doi.org/10.30892/gtg.542spl02-1253

Abstract: The purpose of this study is to use an extended gravity model to examine the factors that influence the demand for tourism from origin nations to Vietnam. Data from eleven major marketplaces were gathered for the study between 2005 and 2020. The research employs stepwise regression techniques to choose variables and testing procedures to identify the most suitable model among Ordinary Least Squares (OLS), Random Effects Model (REM), Fixed Effects Model (FEM), and Feasible Generalized Least Squares (FGLS) models. The gravity model comprises variables associated with geographic features, tourism supply capacity, demand attributes, and interconnected variables. Surprisingly, geographical distance holds no statistical significance in the international tourist demand model based on the gravity model, a phenomenon bolstered by globalization. Conversely, the emerging investment factor in restaurants and hotels emerges as the most pivotal determinant influencing tourism demand. Hence, the tourism sector must devise nation-specific policies that target key influencing factors and actively appeal to potential source markets to attract visitors.

Keywords: gravity model, Vietnam, tourism demand, FGLS, FEM, stepwise regression

* * * * * *

INTRODUCTION

As globalization spreads, the tourism industry faces escalating competition, prompting leaders of nations to frequently adopt strategies aimed at attracting visitors to their countries. Hence, researchers, operators, and tourism businesses are keenly interested in identifying the factors that impact the influx of foreign tourists to a country. Accurately gauging the capacity to allure international tourists is crucial for the tourism sector in efficiently managing and enhancing the suitable technical tourism infrastructure. The gravity model stands as the most widely used model for evaluating tourism demand (Peng et al., 2015; Wu et al., 2017; Song et al., 2019; Rosselló-Nadal and Santana-Gallego, 2022; Song et al., 2023). Furthermore, Song et al. (2023) synthesize existing literature and acknowledge that the integration of supply and demand in tourism models represents a novel research direction that has emerged recently. Hence, this research constructs a tourism demand framework using the gravity model and formulates constituent variables derived from factors such as geographical proximity, tourism demand, and destination capacity.

Foreign tourist arrivals (FTA) are the most frequently used measure. As delineated by Sheldon (1993), Peng et al. (2015), Wu et al. (2017), Song et al. (2019), Rosselló-Nadal and Santana-Gallego (2022) and Song et al. (2023), quantifying tourism demand via the enumeration of FTA serves as the cornerstone for tourism product providers in directing their investments and aligning their service capacities with the volume of visitors. Moreover, evaluating tourism demand by considering international tourist spending is a valid criterion, but ensuring its accuracy compared to tourist numbers is challenging, potentially due to the limited sample size (Song et al., 2019). In addition, the number of nights spent at a destination is often recorded by accommodation establishments and can be used as a criterion to measure tourism demand (Song et al., 2019; Rosselló-Nadal and Santana-Gallego, 2022; Song et al., 2023). In the context of assessing methodologies for quantifying tourism demand, the metric of international tourist arrivals emerges as the paramount indicator for gauging demand with the utmost precision, rendering it highly appropriate for evaluating tourism influx in the host nation. Vietnam's tourism source market primarily consists of 72% from the Asia-Pacific region, with 14% from Europe, and 7% from North America (Vietnam's MCST, 2014). Vietnam is currently experiencing significant variation in international tourist numbers by country. This underscores the imperative for research aimed at discerning the factors influencing the nationality-specific influx of international tourists into Vietnam. This holds importance both in scientific and practical terms as it assists Vietnam in identifying its target international tourist market and adjusting policies to attract visitors from specific countries based on influencing factors.

This study aims to enhance the current literature in four key contents. Firstly, it will entail the identification of the most suitable variables for inclusion in the gravity model and the subsequent validation of the significance of geographical distance as a main factor influencing tourism demand. Furthermore, the study explores the effects of foreign direct investment (FDI) and capital investment in the hospitality industry, augmenting the standard set of variables found in the general research on tourism demand (Song and Li, 2008; Song et al., 2019; Rosselló-Nadal and Santana-Gallego, 2022;

* Corresponding author

Song et al., 2023). Previous studies exploring the cause-and-effect connection between FDI and Vietnam's tourism industry (Suntikul et al., 2010; Nunkoo and Seetanah, 2018; Le et al., 2022) require validation when assessing tourism demand. Additionally, the study appraises the impact and statistical relevance of variables describing the economic conditions in the tourists' home countries and Vietnam's supply capacity. Lastly, the study utilizes dynamic panel data to scrutinize the impact and statistical significance of variables delineating the economic situations in the tourists' home countries and Vietnam's service capacity, indicating a policy framework for the future enhancement of the international tourism market.

The article is structured into five sections. The next section offers a literature review on international tourism demand. Following that, it covers data compilation, model testing, and the choice of an appropriate panel data model. Finally, the study presents results, discussions, conclusions, and policy implications in subsequent sections.

A theoretical foundation for the gravity model in tourism

Establish a gravity-based tourism demand model

The theory of economic gravity is predicted in bilateral economic relations and applied in the analysis of international trade flows, FDI, or international tourist flows based on economic size and distance between two countries. Applying gravity theory to build a tourism demand model (TD_{ij}) based on three groups of factors: a group of factors affecting the supply of the host country (M_i) and group of factors affecting tourist demand in visitor country (M_j), the distance between the two countries (D). The interplay of pull factors (in destination countries) and push factors (in origin countries) significantly influences the flux of international tourists, rendering all three sets of factors pivotal in ascertaining the level of tourism demand. Alternatively, gravity theory posits that the assumption of tourists between two countries is contingent upon the size of their respective economies (measured by GDP/GNP) and their relative wealth (indicated by GDP/GNP per capita). According to statistics of Wu et al. (2017) Rosselló-Nadal and Santana-Gallego (2022) and Song et al. (2023), the utilization of GDP/GNP per capita in research studies is threefold higher than the incorporation of GDP/GNP.

The basic gravity model of tourism demand is as follows:

$$FTA_{ij} = G\frac{M_i\ M_j}{D_{ij}} \qquad (1)$$

In which:

FTA_{ij}: stands for foreign tourist arrivals from the origin country (i) to the destination country (j)

M_i: Variables impacting the host country's supply

M_j: Variables impacting the demand from tourists in the country (j)

G: Attractiveness index/Connection index; D_{ij}: distance between 2 countries

Logarithmic transformation of equation (1) reveals:

$$LnFTA_{ij} = LnG + lnM_i + lnM_j - lnD_{ij} \qquad (2)$$

Variables impacting the host country's supply (M_i)

The cost of tourism products within a destination serves as the primary determinant of tourism demand. The total cost of travel includes both package tours and individual services. Consequently, in practical terms, determining the price of travel services is a complicated task, and the tourist price index is its own set of challenges to collect (Nguyen, 2022). In scholarly investigations, the CPI is a commonly adopted indicator where data for two indicators is absent (Seifi et al., 2020; Nguyen, 2022; Song et al., 2023). The relationship between price changes and demand fluctuations does not show a continuous line. Indeed, if a price adjustment occurs, but it is not significant enough for a tourist, or falls below their threshold, the change may not even affect demand. For example, Kulendran (1996) addressed the case of English and Japanese tourists visiting Australia, and Chasapopoulos et al. (2014) studied the situation of tourists visiting Greece. Travelers commonly neglect to recognize the advantages and financial implications of a specific service during their voyage. Simultaneously, some experiences cannot be hedonic pricing and implicit prices are created by non-commercial products such as landscapes, the hospitality of residents, etc.

Rising costs of tourism at a destination adversely impact the demand for tourism (Forsyth and Dwyer, 2009; Kim and Lee, 2017; Rosselló-Nadal and He, 2020; Rosselló-Nadal and Santana-Gallego, 2022). Travelers will be more willing to spend when they believe the pricing at the destination is fair, and vice versa (Divisekera, 2010; Meyer, 2013; Kim and Lee, 2017). Particularly, the sensitivity of tourism spending is greater towards income levels than to pricing (Chasapopoulos et al., 2014; Peng et al., 2015). Increasing inflation escalates the costs of services and tour prices, adversely impacting the demand for tourism from markets experiencing a decline in foreign tourism demand (Chasapopoulos et al., 2014; Peng et al., 2015). In contrast, price elastic demand can be positive due to the income effect (Crouch, 1995; Peng et al., 2015) for either inferior goods or luxury goods depending on the income effect on demand (Dogru et al., 2021). Research on tourism demand frequently incorporates variables of comparative and competitive prices, rather than solely relying on the CPI of the destination country.

The concept of tourism infrastructure encompasses all physical components intentionally designed and constructed to cater to the needs and requirements of tourists (Koutoulas, 2015). Tourism infrastructure exhibits the potential to increase competitiveness and advance the tourism industry through the provisioning of services that meet the multifaceted demands of tourists. Tourism offerings encompass both tangible and intangible aspects like accommodation, transportation, and leisure activities, which are interdependent and collectively shape the desired tourist experience (Koutoulas, 2015). The

hotel and restaurant industry holds notable importance in tourism infrastructure, as highlighted by studies conducted by Wu et al. (2017), Ghaderi et al. (2018) and Nguyen (2021). Notably, Nguyen (2021) confirmed the prominence of the impact coefficient attributed to investments in hotels and restaurants on the volume of international tourists choosing to stay in Vietnam. Nevertheless, in the analysis presented by Song and Li (2008) and Rosselló-Nadal and Santana-Gallego (2022) on the tourism demand, the variable pertaining to investment in tourism infrastructure has not garnered considerable emphasis.

The incorporation of the political/risk/event variable within the structure of the tourism demand model or the destination attraction index is imperative owing to its substantial impact on tourists' behavior and decision-making, as evidenced consistently across a range of scholarly investigations, encompassing works by Song and Li (2008), Butler and Suntikul (2012), Peng et al. (2015), Xu et al. (2019), Ulucak et al. (2020), Rosselló Nadal and Santana-Gallego (2022), Song et al. (2023) and Cehan and Iațu (2024). Potential risks and crisis incidents, such as natural catastrophes, political instability, or epidemic outbreaks, can instigate apprehensions among travelers pertaining to their safety and well-being. Xu et al. (2019) revealed that China's international tourism growth remained quite consistent from 1995 to 2014, albeit punctuated by the adverse impact of the 2003 SARS pandemic on the tourism sector. Consequently, the analysis adopts dummy variables to address these disruptions. Furthermore, this study employs the World Governance Indicator as a means to quantify the political risk variable. Conversely, Ulucak et al. (2020) utilize data from the Global Terrorism Database to incorporate a variable representing the frequency of terrorist incidents. Rosselló-Nadal and Santana-Gallego (2022) synthesized data and found that, in 85% and 76.4% of the cases, respectively, security risks and political instability had unfavorable effects on foreign visitor arrivals. So, understanding political/risk variables facilitates the identification of vulnerable groups and pinpointing specific risks that have an impact on demand, allowing policymakers to implement targeted countermeasures to protect the tourism industry in emergencies.

Variables impacting tourist demand in origin country (M_j)

A greater GNP per capita is indicative of increased disposable income and greater purchasing power, resulting in heightened demand for international tourism due to the enhanced capacity to finance travel, as confirmed by various research studies (Kim and Lee, 2017; Shafiullah et al., 2019; Yerdelen-Tatoglu and Gul, 2020; Rosselló-Nadal and Santana-Gallego, 2022). Specifically, among the 32 studies examined, 30 of them identified a positive and statistically significant impact, and none of the studies demonstrated a negative effect (Rosselló-Nadal and Santana-Gallego, 2022).

Although Rosselló-Nadal and Santana-Gallego (2022) found consistent results, the literature review reveals that the income elasticity of demand varies based on factors such as the destination, period, and the specific model employed, among others. For tourists originating from the United States, Japan, the United Kingdom, and New Zealand, the coefficient measuring the income elasticity of demand surpasses the value of 1 when they travel to Australia, indicating that such travel is viewed as a luxury good (Kulendran, 1996).

Alternatively, in studies conducted in Malaysia (Hanafiah and Harun, 2010), a coefficient between 0 and 1 signifies that tourism demand is inelastic, thus identifying it as an essential good. A negative income elasticity of demand coefficient suggests that tourism products in Greece are perceived as inferior goods by European tourists, prompting a shift towards other markets (Dritsakis and Gialetaki, 2004). The income elasticity of demand differs among various tourism types. Business and luxury travel demand demonstrates inelasticity (Kulendran, 1996), signifying that the trips' perceived value surpasses their travel expenses. Compared to leisure tourism, demand for visits from friends and family is less elastic (McCann et al., 2010), suggesting that these trips are more required, much like work travel.

The population serves as a representative measure indicative of the potential tourism demand, consequently providing the foundation for forecasting tourist flows. A larger population within the origin country indicates a higher number of potential tourists. Rosselló-Nadal and Santana-Gallego (2022) observe that approximately 60% of investigations concerning tourism demand incorporate population variables. In contrast, Leitão (2010) concludes that the prevalence of multicollinearity issues often precludes the inclusion of the population variable in numerous studies, many studies omit the population variable since it is closely linked to income. Recognizing a positive correlation between the population of the origin country and the dynamics of tourism flows, this relationship encompasses 87.7% of collective outcomes as delineated by Rosselló-Nadal and Santana-Gallego (2022).

For a more comprehensive understanding of tourist preferences and behaviors, it is essential to incorporate variables like GNP, GNP per capita, and spending levels alongside population size, which alone cannot sufficiently represent their heterogeneity. The internet has played a significant role in flattening the world, enhancing accessibility to information, and shaping tourists' choices of destinations. Both the internet infrastructure of a destination country and tourists' proficiency in using the internet heavily influence these decisions. On the other hand, social media platforms provide travel service providers with cost-effective and easily accessible avenues to connect with tourists (Katsikari et al., 2020). Rosselló-Nadal and Santana-Gallego (2022) synthesized sociocultural and internet-related variables, attributing 80% of the occurrence to their frequency. Additionally, Vu and Ngo (2019) discovered that 27.37% of international visitors to Phu Quoc Island in Vietnam rely on the Internet as their second most important source of information, after recommendations from friends, colleagues, or relatives. Furthermore, Adeola and Evans (2019) established a bidirectional causal relationship between internet usage and tourism.

Variables with connections

The study substitutes bilateral trade turnover with FDI from the sending country to the destination country as a basis for analyzing the flow relationship regarding tourist arrivals. Thus, concerning bilateral factors, including price/exchange rate

disparities, FDI, and geographical distance between countries, the study highlighted their significant influence on the number of international tourists visiting the destination country. The influence of price on international tourism demand encompasses not only destination prices but also the relative price comparison between destination and sending countries. Relative prices are computed by dividing CPI of the destination country by that of the tourist's country. In addition to the relative price index, certain research utilizes the concept of purchasing power parity (PPP). The Price Competitive Index (PCI), calculated as the ratio between the destination country and the home country, adjusted by the bilateral exchange rate, is referred to as the real exchange rate (Equation 3). In contexts of imperfect market information, tourists exhibit prompt reactions to fluctuations in exchange rates, while their response to relative inflation rates is more gradual (Forsyth and Dwyer, 2009). Consequently, the exchange rate has a more immediate effect on tourism demand than the competitive price index.

$$Price\ Competitive\ Index = \frac{Purchasing\ Power\ Parity}{Exchange\ Rate} \times 100 \quad (3)$$

According to Rosselló-Nadal and Santana-Gallego (2022), the variables CPI/relative price/PPP and exchange rate integrated into the model represent 46% and 29% of the aggregate number of articles, respectively. Inconsistency exists in the directional effect of price/CPI/PPP/exchange rate across studies, with 85% of research outcomes demonstrating a negative correlation, while the remainder indicates a positive correlation (Rosselló-Nadal and He, 2020). Studies typically examine either CPI/relative prices/PPP (Kusni et al., 2013; Chasapopoulos et al., 2014; Dogru et al., 2021) or exchange rate/real exchange rate/PCI (Dritsakis, 2004; Xu et al., 2019), or a combination thereof (Hanafiah and Harun, 2010; Velasquez and Oh, 2013; Kim and Lee, 2017; Shafiullah et al., 2019; Ulucak et al., 2020; Mavrommati et al., 2021). However, the studies fail to elucidate the rationale behind their inclusion of price variables while excluding exchange rate variables or a combination of both. The relationship between the dynamics of international tourism and FDI has been the subject of numerous academic studies. However, the results show non-uniformity in the relationship's direction and intensity, which can be attributed to various contextual elements, study settings, sets of influencing variables, etc. Le et al. (2022) specifically noted this non-uniformity within the same research site.

Should a cohesive causal relationship between FDI and FTA be demonstrated, it shows that shifts in FDI inflows can directly impact the number of foreign tourists, and vice versa (Tang et al., 2007). Increased FDI levels in the tourism industry, particularly in infrastructure, services, and hospitality facilities, have the potential to draw in a bigger number of foreign visitors (UNCTAD, 2007). Overall, investment in all sectors attracts current or potential investors, enhancing the nation's appeal (Kulendran and Wilson, 2000; UNCTAD, 2007).

On the contrary, the reciprocal interplay between FDI and FTA exhibits a dynamic evolution across different periods (Craigwell and Moore, 2008; Andergassen and Candela, 2013; Tomohara, 2016). Furthermore, given the temporal nature of FDI and FTA dynamics, some studies utilize methodologies like VAR, ARDL, GARCH, etc. to scrutinize temporal lags and elucidate the interrelationships within short-term and long-term contexts. Tourism demand models integrate common statistical independent variables while excluding the FDI variable (Song and Li, 2008; Peng et al., 2015; Song et al., 2019; Rosselló-Nadal and Santana-Gallego, 2022; Song et al., 2023).

Geographical proximity stands as a fundamental component in the gravitational model that interlinks two economies, playing a crucial role in shaping the tourism demand framework. Decreased geographical distances between nations foster advantageous circumstances by lowering travel expenses and time, particularly for time-sensitive trips, thereby bolstering tourist flows. Rosselló-Nadal and Santana-Gallego (2022) observed that a substantial majority, amounting to 93% of studies, demonstrate an inverse relationship between geographical distance and the influx of international tourists. These findings offer evidence that challenges the concept of globalization and diminishes the significance of distance on both trade and tourism.

Table 1. Variables and data sources

Variables	Definition	Data source
FTA_{it}	Number of FTA from country i to Vietnam at time t	GSO of Vietnam
Variables impacting the host country's supply		
$VNCPI_t$	Vietnam consumer price index at time t	GSO of Vietnam
$OEXRUS_{it}$	Official exchange rate of Vietnam to the United States at time t	World Bank's WDI
CHR_t	Capital invested in hotel and restaurant	GSO of Vietnam
CRISIS	0: 2005-2008; 1: 2009-2014; 2: 2015-2019: 3: 2020	
Variables impacting tourist demand		
GNI_{it}	GNI per capita PPP of originating country i at time t	World Bank's WDI
POP_{it}	Population of a sending country i at time t	World Bank's WDI
CPI_{it}	Consumer price index of originating country i at time t	GSO of Vietnam
INT_{it}	Internet of sending country i at time t	World Bank's WDI
Variables with connections		
PPP_{it}	Purchasing Power Parity between Vietnam and the originating country i at the time t	World Bank's WDI
$OEXR_{it}$	Official exchange rate of Vietnam to originating country i at time t, representing the value of local currency units against the US dollar.	World Bank's WDI
PCI_{it}	Price competitive index of originating country i at time t	Equation 3
FDI_{it}	FDI from sending country i at time t (million USD)	GSO of Vietnam
DIS_i	Distance between Vietnam's capital to tourist-sending country i	CEPII

DATA AND METHODOLOGIES

Data and variable definitions

The study utilizes panel data analysis to estimate a tourism demand model, aiming to identify factors influencing the influx of foreign tourists visiting Vietnam. Specifically, the aggregated dataset from 11 countries visiting Vietnam, which constitutes 85% of the total FTA, serves as the basis for quantifying international tourism demand in Vietnam. The 11 countries examined in the research comprise China (CHN), Macao-China (MAC), Korea (KOR), Japan (JPN), Thailand (THAI), Malaysia (MYS), Russia (RUS), UK (GBR), France (FRA), Australia (AUS), and the USA (USA). The research gathered yearly data covering the period from 2005 to 2020, sourced from credible institutions such as the General Statistics Office of Vietnam, CEPII and the World Bank.

The process of model selection via statistical tests

The research employs a stepwise regression technique by sequentially adding variables to the model, prioritizing criteria like minimum p-value, maximum absolute t-value, and maximum R-squared value. Panel data can theoretically have group effects, time effects, or both. These effects can be fixed or random. The analysis of panel data pertaining to non-cointegration series involves the consideration of three distinct methodological approaches: OLS, REM, and FEM. The study also employs the Feasible Generalized Squares (FGLS) technique, incorporating its attributes to address autocorrelation and variance heterogeneity. As reported in the study conducted by Rosselló-Nadal and Santana-Gallego (2022), the adoption of the FGLS model is a seldom-encountered practice, constituting a mere 3% of the overall study cohort.

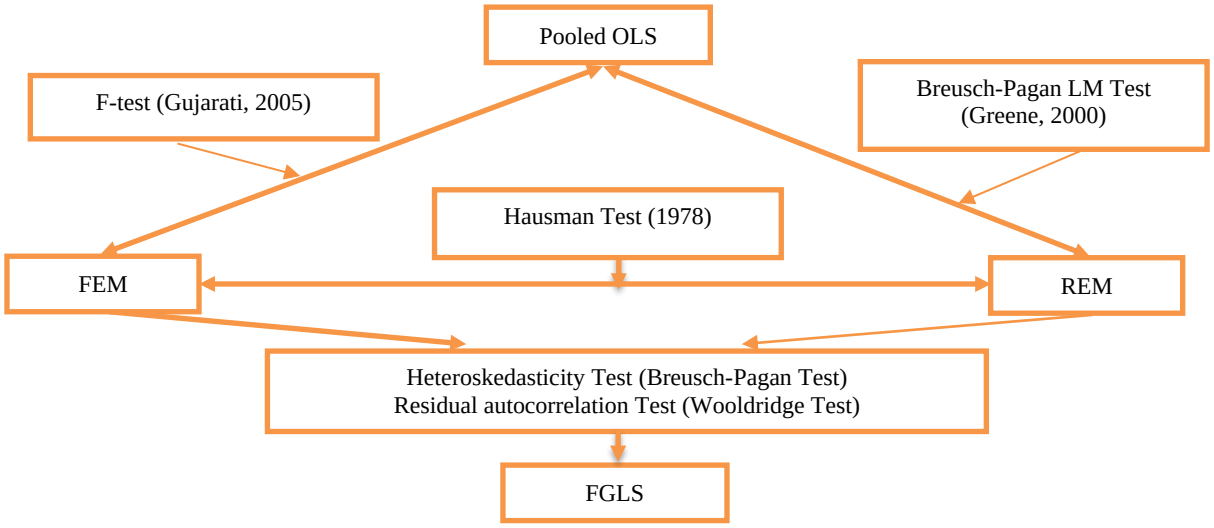

Figure 1. Optimal model selection sequence through testing

Figure 1 shows the flow of the process of choosing the best model through testing techniques. The F-test is utilized to assist in assessing the appropriate model in two Ordinary Least Squares (OLS) and Fixed Effects Model (FEM) analyses. This test is conducted to examine the presence of heteroskedasticity in the model, with the hypotheses: H_0: There is no difference between Pooled and FEM, H_1: The FEM model is more appropriate than Pooled OLS. The Breusch-Pagan LM Test is conducted to assess the presence of cross-sectional correlation and to evaluate the compatibility between the OLS and REM models. The hypotheses are formulated as follows: H_0: The appropriate model is OLS; H_1: The preferred model is REM. The Hausman test is conducted to select between REM and FEM models, with the hypotheses: H_0: no systematic difference in coefficients between REM and FEM models or preference for REM model; H_1: preference for FEM model.

Through the testing procedure to select the optimal model among the three models OLS, REM, or FEM, it is still not enough to determine which is the best model. Therefore, the next step needs to check the defects of the REM/FEM model through heteroskedasticity testing (Breusch-Pagan test) and residual autocorrelation test (Wooldridge test). In instances, the model encounters multicollinearity, residual autocorrelation, or a simultaneous occurrence of both phenomena, the FGLS is recommended. Wooldridge (2002) recommends employing FGLS estimation to address heteroskedasticity or residual autocorrelation in panel data models. The FGLS model's estimation does not shed light on how each country is affected by the influence of the individual variables.

RESULTS AND DISCUSSION

Variable selection for the international tourism demand in Vietnam

Before conducting the regression analysis, the research assessed the correlation among variables and identified pairs of variables (LnPPP, LnOEXRVN); (LnOEXRVNUS, CRISIS); (LnCHR, CRISIS); (LnOEXRVNUS, LnCHR) that exhibit high correlation, necessitating their elimination (Table 2). Besides assessing correlation levels, the study conducted stepwise regression to choose suitable variables for the model. In line with the research goal of investigating the impact of tourism infrastructure on tourism demand, the variable LnCHR will be kept, while LnOEXRVNUS and CRISIS will be excluded from the list of variables. Subsequently, the research executed a stepwise regression procedure comprising six steps,

with the outcomes presented in Table 3. The cluster of variables associated with price and exchange rates is organized based on their decreasing impact, listed as follows: LnVNCPI, LnPPP, LnOEXR, LnCPI, and LnPCI. This suggests that foreign tourists prioritize sensitivity to the destination country's price index over the official exchange rate, rather than the real exchange rate. The lack of statistical significance in variables LnDIS and LnINT leads to their removal from the international tourism demand. Thus, the sequence in which six variables are incorporated into the model for international tourism demand in Vietnam across six steps is as follows: LnCHR, LnFDI, LnPOP, LnVNCPI, LnOEXR, and LnGNI.

Table 2. Correlation results, Note:* p<0.1; ** p<0.05; *** p<0.01

	Lnfta	Lngni	Lnpop	Lnppp	Lnvncpi	Lncpi	Lnpci	Lnoe xrvn	Lnoe xrvnus	Lnchr	Lnfdi	crisis	Lndis	Lnint
Lnfta	1.00													
Lngni	0.04	1.00												
Lnpop	0.23*	-0.61*	1.00											
Lnppp	0.34*	-0.09	0.01	1.00										
Lnvncpi	0.07	0.08	0.007	0.006	1.00									
Lncpi	-0.27*	-0.12	-0.005	0.04	0.35*	1.00								
Lnpci	0.007	0.59*	-0.01	-0.11	-0.03	-0.32*	1.00							
Lnoex rvn	0.32*	-0.20*	0.02	0.98*	0.01	0.10	-0.30*	1.00						
Lnoex rvnus	0.42*	0.27*	0.02	0.02	0.12	-0.09	-0.02	0.02	1.00					
Lnchr	0.46*	0.28*	0.02	0.02	0.25*	-0.04	-0.02	0.02	0.97*	1.00				
Lnfdi	0.49*	0.15*	-0.14	0.47*	0.21*	-0.35*	0.004	0.45*	0.06	0.10	1.00			
crisis	0.32*	0.25*	0.02	0.02	0.28*	-0.009	-0.04	0.03	0.91*	0.90*	0.09	1.00		
Lndis	-0.11	0.36*	0.34*	-0.24*	-0.00	0.09	0.73*	-0.37*	-0.00	0.00	-0.38	-0.00	1.00	
Lnint	0.23*	0.71*	-0.19*	0.04	0.1738*	-0.20*	0.59*	-0.07	0.50*	0.51*	0.16*	0.48*	0.41*	1.00

Table 3. Select the appropriate variable for the tourism demand model

X	**LnGNI**	**LnPOP**	**LnCPI**	**LnVNCPI**	**LnPPP**	**LnOEXR**	**LnPCI**	**lnCHR**	**LnFDI**	**LnDIS**	**LnINT**
Step 1											
b	1.734	0.1947	-1.137	0.477	0.360	0.256	0.043	0.737	0.125	-0.105	0.438
t-statistic	10.71	1.55	-2.78	1.30	3.13	2.76	0.14	12.90	2.80	-0.45	3.09
P-value	0.000	0.122	0.005	0.192	0.002	0.006	0.891	0.000	0.005	0.655	0.002
R-squared	0.001	0.054	0.071	0.004	0.115	0.105	0.000	0.215	0.245	0.012	0.052
Step 2: LnFTA=LnCHR +X_2											
b	-0.143	0.109	-1.340	-0.379	0.138	0.126	0.036		0.228	-0.105	-0.020
t-statistic	-1.42	3.40	-3.84	-0.76	5.29	4.98	0.26		7.71	-1.66	-0.13
P-value	0.159	0.001	0.000	0.451	0.000	0.000	0.796		0.000	0.098	0.897
R-squared	0.220	0.260	0.273	0.213	0.321	0.340	0.211		0.412	0.223	0.211
X	LnGNI	LnPOP	LnCPI	LnVNCPI	LnPPP	LnOEXR	LnPCI	lnCHR	LnFDI	LnDIS	LnINT
Step 3: LnFTA= LnCHR+ LnFDI +X_3											
b	-0.233	0.143	-0.576	-1.072	0.065	0.057	0.030			0.069	-0.154
t-statistic	-2.68	5.31	-1.74	-2.46	2.39	2.21	0.25			1.16	-1.17
P-value	0.008	0.000	0.084	0.015	0.018	0.029	0.805			0.249	0.243
R-squared	0.436	0.495	0.423	0.432	0.431	0.429	0.413			0.417	0.417
Step 4: LnFTA= LnCHR+ LnFDI + LnPOP + X_4											
X	LnGNI	LnPOP	LnCPI	LnVNCPI	LnPPP	LnOEXR	LnPCI	lnCHR	LnFDI	LnDIS	LnINT
b	0.069		-0.486	-1.137	0.053	0.046	0.035			-0.027	-0.010
t-statistic	0.66		-1.57	-2.82	2.09	1.91	0.31			-0.47	-0.08
P-value	0.513		0.118	0.005	0.038	0.058	0.757			0.640	0.937
R-squared	0.496		0.502	0.518	0.508	0.506	0.495			0.496	0.495
Step 5: LnFTA= LnCHR+ LnFDI + LnPOP + LnVNCPI + X_5											
X	LnGNI	LnPOP	LnCPI	LnVNCPI	LnPPP	LnOEXR	LnPCI	lnCHR	LnFDI	LnDIS	LnINT
b	0.072		-0.099		0.046	0.040	0.025			-0.015	0.003
t-statistic	0.70		-0.28		1.83	1.68	0.23			-0.26	0.02
P-value	0.487		0.777		0.069	0.095	0.819			0.796	0.983
R-squared	0.519		0.518		0.527	0.525	0.518			0.518	0.518
Step 6: LnFTA= LnCHR+ LnFDI + LnPOP + LnVNCPI + LnOEXR + X_6											
X	LnGNI	LnPOP	LnCPI	LnVNCPI	LnPPP	LnOEXR	LnPCI	lnCHR	LnFDI	LnDIS	LnINT
b	0.143									0.012	0.037
t-statistic	1.31									0.21	0.29
P-value	0.191									0.837	0.769
R-squared	0.530									0.526	0.526
Final Model: LnFTA= LnCHR+ LnFDI + LnPOP + LnVNCPI + LnOEXR + LnGNI											

Investigate determinants impacting the demand for international tourism in Vietnam

The F-test results for selecting the OLS and FEM models show a p-value <0.000 (Table 5), leading to the rejection of H_0 and the acceptance of H_1. This implies endorsing the FEM while dismissing OLS model. Concurrently, the Breusch-Pagan LM Test's p-value (Table 5) supports the rejection of H_0 and the acceptance of H_1, thus validating the adoption of the REM. The subsequent step, employing the Hausman test to choose between FEM and REM, has indicated that rejecting the REM model entails selecting the FEM model.

Table 4. A comparison between Pooled OLS, FEM, REM & FGLS estimates
Note: T: statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

Ind. Var	Pooled OLS	FEM	REM	FGLS
LnCHR	0.528 ***; [7.01]	0.423***; [4.07]	0.370***; [4.52]	0.581***; [4.91]
LnFDI	0.231 ***; [7.30]	0.037; [1.04]	0.040; [1.13]	-0.0059; [-0.18]
LnPOP	0.169 ***; [4.97]	-3.435***; [-3.59]	0.248*; [2.24]	-4.742***; [-4.17]
LnVNCPI	-1.061 **; [-2.64]	-0.592*; [-2.20]	-0.588*; [-2.09]	-0.414*; [-1.71]
LnOEXR	0.050*; [2.02]	0.721***; [3.31]	0.226**; [2.97]	0.377; [1.50]
LnGNI	0.143; [1.31]	1.26***; [4.15]	0.829***; [3.23]	0.972**; [2.94]
CONS	-0.243; [-1.45]	51.224; [3.05]	-8.747*; [-2.46]	71.64***; [3.80]
N	176	176	176	176
R2	0.543	0.611	0.547	
Model significance	F(6,169)=35.15 Prob>F = 0.000	F(6, 159)=102.71 Pro>F = 0.000	Wald chi2(6) = 296.93 Prob > chi2 = 0.000	Wald chi2(16) = 490.42 Prob > chi2 = 0.000

To test the deficiencies of the FEM model, conduct tests for heteroscedasticity (Breusch-Pagan test), and residual autocorrelation (Wooldridge test). The results from Table 5 reveal that the FEM model solely exhibits first-order autocorrelation. To ensure an unbiased and effective model selection, the study employs FGLS estimation to mitigate the first-order autocorrelation observed in the FEM model. The regression outcomes from the FGLS models, as depicted in Table 4. A notable decrease in the standard errors and significance of the regression coefficients compared to those obtained through OLS, REM, FEM, and FGLS models, suggests that the FGLS method yields more precise estimations of the regression coefficients. Investment in tourism infrastructure, particularly within Vietnam's hotel and restaurant sector, demonstrates a positive and statistically significant impact, playing a pivotal role in attracting international tourists. This finding aligns with the outcomes of prior studies conducted by Nguyen (2021). High-quality hotels and restaurants offer tourists a comfortable and convenient environment for relaxation and the enjoyment of local cuisine. As the demand for quality tourism services rises, it's imperative for hotels and restaurants to offer professional and distinctive experiences, crucial for fostering long-term travel intentions or future returns to Vietnam. The results from the four models presented in Table 4 indicate the necessity of incorporating a variable representing the tourism industry's supply capacity, particularly focusing on tourism infrastructure, to evaluate tourism demand.

Table 5. Model selection via statistical tests

No	Objective	Test results	Conclusion
Select the optimal model OLS, REM, FEM			
1	OLS&FEM	F-test: F(10,159)=28.98; Pro>F=0.000;	FEM
2	OLS & REM	Breusch-Pagan LM Test: Chibar2(01)= 251.79; Prob> chibar2=0.000.	REM
3	FEM & REM	Hausman Test: Chi2(6)= 27.46 Prob>Chi2=0.000.	FEM
Test FEM model			
1	Heteroskedasticity	Modified Wald test: chi2 (11) = 7.54; Prob>chi2 = 0.7542	No heteroskedasticity
2	First-order autocorrelation	Wooldridge test: F(1, 10)= 22.291; Prob > F = 0.0008 <5%	First-order autocorrelation

Research by Le et al. (2022), and Suntikul et al. (2010) examine the correlation between FDI and various facets of tourism in Vietnam, yielding heterogeneous findings. This study also determined that the influence of FDI capital on FTA is limited and lacks statistical significance. Therefore, this connection lacks a stable basis for establishment, requiring time to construct and nurture. Over the long term, most source markets exhibit positive growth in both FDI and FTA, except for the Russian market, which experiences a decline in FDI over time. FDI experiences significant fluctuations in response to economic and political crises. Vietnam stands out as an appealing investment destination within the region amid the COVID-19 pandemic due to its effective pandemic control measures. This is particularly evident given the redirection of capital flows from China, notably from countries such as Japan, South Korea, and Taiwan, aiming to mitigate the repercussions of the US-China trade tensions stemming from signed free trade agreements. Conversely, FTA exhibits lower volatility attributed to political and economic crises, yet conversely, it is profoundly impacted by the COVID-19 pandemic. Thus, in 2020, the connection between FDI and FTA is anticipated to show divergent patterns.

The population scale of the researched countries is statistically significant and impacts the volume of international visitors to Vietnam. Nevertheless, the observed correlation deviates from expectations, as it suggests that the rise in population not only fails to stimulate international tourist arrivals but also diminishes them in Vietnam. The sign of this relationship is opposite to the combined results of Rosselló-Nadal and Santana-Gallego (2022). That is, the increase in the population of the origin country may increase domestic tourism or choose other destination markets instead of choosing the

Vietnamese market. The significant gap between population and international tourist numbers is predominantly observed in four countries: China, Russia, the United Kingdom, and France. Unlike RUS, GBR, and FRA, although CHN has a common border with Vietnam and a high annual population growth rate, the increase in international visitors from CHN is not compatible with population growth. Therefore, the Chinese market is considered a potential market for the future development of tourism. Conversely, Macao-China (MAC) has a low population but attracts a high number of international tourists, resulting in the smallest disparity between population and FTA among source markets. Notably, MAC is among the top five countries with the highest amount of FDI in Vietnam.

Upon comparing the signs and statistical significance of variables LnVNCPI and LnOEXR (Table 4), it becomes apparent that foreign tourists arriving in Vietnam exhibit a greater degree of sensitivity to fluctuations in the CPI compared to the exchange rate. The inverse correlation between Vietnam's CPI and tourism demand mirrors findings from approximately 85% of previous studies, as documented by Rosselló-Nadal and Santana-Gallego (2022). Vietnam's CPI experienced sudden fluctuations with a notable decline, especially during the period from 2007 to 2009. However, since 2010, Vietnam's CPI has steadily risen at a rate of 4% per year up to 2020. Vietnam's escalating CPI contributes to heightened costs across goods, services, and transportation, rendering international tourism more costly and dampening the demand for it within Vietnam. Contrary to the fluctuations in the CPI, the exchange rate between the Vietnamese Dong (VND) and the US Dollar remains under state control, exhibiting modest variability, typically experiencing an annual rate of 2.5%. Government intervention in regulating the exchange rate distorts its reflection of market prices, thereby preventing the establishment of a statistically meaningful relationship.

The GNP per capita in all three models, namely FEM, REM, and FGLS, exhibits a statistically significant positive influence on the influx of international visitors to Vietnam. This finding aligns with the outcomes of research conducted by Shafiullah et al. (2019), Kim and Lee (2017), Yerdelen-Tatoglu and Gul (2020), and Rosselló-Nadal and Santana-Gallego (2022). The income elasticity of demand for Vietnamese tourism products stands at 0.972, nearing 1, indicating that these products are essential. As a result, consumers exhibit limited changes in their demand for tourism services regardless of fluctuations in their income levels. This may indicate the necessity or the stability of demand for tourism products in some instances, where consumers view travel as an indispensable fundamental need.

Table 6. The country-specific fixed-effect coefficients derived from the FGLS model

	CHN	**MAC**	**KOR**	**JPN**	**THAI**	**MYS**	**RUS**	**GBR**	**FRA**	**AUS**	**USA**
α	0	21.81*** [4.61]	4.928*** [4.10]	4.692*** [4.01]	7.268** [3.02]	2.584 [1.25]	-18.38*** [-4.45]	1.431** [2.80]	7.549** [3.18]	4.894** [3.00]	12.82*** [4.29]

The FGLS model, derived from the FEM framework, elucidates the fixed impact coefficients for each examined country, as displayed in Table 6. The fixed effects coefficients for MAC, USA, FRA, THAI, KOR, AUS, JPN, MYS, GBR, CHN, and RUS are listed in descending order. Hence, in the absence of influencing factors in the model, the influx of tourists from MAC and the USA will still reach a predetermined level of attraction.

Conclusion and some limitations

The study investigates the correlation between pairs of variables and conducts stepwise regression to determine the order of importance of the variables needed to be included in the tourism demand model. The cluster of variables associated with price and exchange rates is ranked in descending order of impact as LnVNCPI, LnPPP, LnOEXR, LnCPI, and LnPCI. This suggests that foreign tourists prioritize sensitivity to the Vietnam's CPI over the official exchange rate, rather than the real exchange rate. The two variables LnDIS and LnINT did not exhibit statistical significance in the study, leading to their exclusion from the research model. The model incorporated variables in the following order: LnCHR, LnFDI, LnPOP, LnVNCPI, LnOEXR, and LnGNI. Through testing procedures, the study selected the FGLS model to examine the factors impacting tourism demand in Vietnam. The variables LnCHR, LnPOP, LnVNCPI, and LnGNI exhibit a statistically significant influence on tourism demand, whereas the variables LnFDI and LnOEXR do not demonstrate a statistically significant impact on tourism demand. Consistent with the outcomes of stepwise regression, international tourists exhibit responsiveness to fluctuations in the CPI. Government control over the exchange rate renders the response of tourists statistically insignificant.

This study makes two significant contributions. Firstly, from a theoretical standpoint, it broadens the scope by incorporating the research variables LnFDI and LnCHR, which have been infrequently addressed in previous tourism demand models. Simultaneously, Vietnam's tourism demand model corroborates the hypothesis of globalization. Secondly, from a methodological standpoint, the study has elucidated the techniques for selecting variables via correlation and stepwise regression, as well as the selection of research models through the use of diagrams. Consequently, for every country under study, the FGLS model, which was based on the FEM model, displayed a fixed impact on Vietnam's tourism demand.

This study holds significance in advancing the formulation of tourism demand models and methodologies for variable selection. Nevertheless, it acknowledges its limitations and proposes new avenues for research, along with recommendations for policymakers. Due to data scarcity, the study was unable to gather data spanning a longer time series. Particularly owing to the influence of Covid-19, there was a sudden decline in tourism demand, leading to certain variables' relationships inadequately representing the long-term landscape. Furthermore, by collecting data from 11 source markets, which represent 85% of the total number of foreign tourists visiting Vietnam, the study also opens up opportunities for deeper research into certain fundamental characteristics with greater development potential, such as

CHN, KOR, JAP, and MAC. Although FDI does not demonstrate statistical significance in Vietnam's tourism demand model, further examination of its influence on tourism demand is warranted in nations where links between tourism and FDI are established. Enhancing tourism development necessitates steadfast commitment across all levels and sectors, guided by cohesive directives. Collaboration and alignment among sectors, management tiers, regions, enterprises, and communities are essential for maximizing tourism benefits and fostering its growth.

Author Contributions: Author Contributions: Conceptualization, P.N.M.L.; methodology, P.N.M.L.; software, P.N.M.L.; validation, P.N.M.L.; formal analysis, P.N.M.L.; investigation, P.N.M.L.; data curation, P.N.M.L.; writing - original draft preparation, P.N.M.L.; writing - review and editing, P.N.M.L.; visualization, P.N.M.L.; supervision, P.N.M.L.; project administration, P.N.M.L. The author have read and agreed to the published version of the manuscript.

Funding: This study was financially supported by research group NNC.DHKT.2023.07 from the University of Economics, Hue University.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: The author appreciates the University of Economics, Hue University for enabling this research.

Conflicts of Interest: The author declare no conflict of interest.

REFERENCES

Adeola, O., & Evans, O. (2019). Digital tourism: mobile phones, internet and tourism in Africa. *Tourism Recreation Research*, 44(2), 190-202. https://doi.org/10.1080/02508281.2018.1562662

Andergassen, R., & Candela, G. (2013). Less developed countries, tourism investments and local economic development. *Review of Development Economics*, 17(1), 16-33. https://doi.org/10.1111/rode.12012

Butler, R., & Suntikul, W. (Eds.). (2010). *Tourism and political change*. Goodfellow Publishers Ltd. London, England.

Cehan, A., & Iațu, C. (2024). A geographical perspective on the impact of Covid-19 on tourism demand in Romania. *GeoJournal of Tourism and Geosites*, *52*(1), 165-175. https://doi.org/10.30892/gtg.52115-1192

Chasapopoulos, P., Den Butter, F.A., & Mihaylov, E. (2014). Demand for tourism in Greece: a panel data analysis using the gravity model. *International Journal of Tourism Policy*, 5(3), 173-191. https://doi.org/10.1504/IJTP.2014.063105

Crouch, G.I. (1995). A meta-analysis of tourism demand. *Annals of tourism research*, 22(1), 103-118. https://doi.org/10.1016/0160-7383(94)00054-V

Craigwell, R., & Moore, W. (2008). Foreign direct investment and tourism in SIDS: Evidence from panel causality tests. *Tourism analysis*, 13(4), 427-432. https://mpra.ub.uni-muenchen.de/33438/

Divisekera, S. (2010). Economics of tourist's consumption behaviour: Some evidence from Australia. *Tourism management*, *31*(5), 629-636. https://doi.org/10.1016/j.tourman.2009.07.001

Dogru, T., Suess, C., & Sirakaya-Turk, E. (2021). Why do some countries prosper more in tourism than others? Global competitiveness of tourism development. *Journal of Hospitality & Tourism Research*, 45(1), 215-256. https://doi.org/10.1177/1096348020911706

Dritsakis, N. (2004). Tourism as a long-run economic growth factor: an empirical investigation for Greece using causality analysis. *Tourism economics*, 10(3), 305-316. https://doi.org/10.5367/0000000041895094

Dritsakis, N., & Gialetaki, K. (2004). Seasonal tourism demand models from USA to Greece. *Tourism Recreation Research*, 29(3), 7-13. https://doi.org/10.1080/02508281.2004.11081452

Forsyth, P., & Dwyer, L. (2009). Tourism price competitiveness. In The Travel and Tourism Competitiveness Report, *Managing in a Time of Turbulence*, World Economic Forum, Geneva, 77-90.

Ghaderi, Z., Hatamifar, P., & Khalilzadeh, J. (2018). Analysis of tourist satisfaction in tourism supply chain management. *Anatolia*, 29(3), 433-444. https://doi.org/10.1080/13032917.2018.1439074

Hanafiah, M.H.M., & Harun, M.F.M. (2010). Tourism demand in Malaysia: A cross-sectional pool time-series analysis. *International Journal of trade, economics and Finance*, 1(1), 80-83. https://doi.org/10.7763/ijtef.2010.v1.15

Katsikari, C., Hatzithomas, L., Fotiadis, T., & Folinas, D. (2020). Push and pull travel motivation: segmentation of the Greek market for social media marketing in tourism. *Sustainability*, 12(11), 1-18. https://doi.org/10.3390/su12114770

Kim, J., & Lee, C.K. (2017). Role of tourism price in attracting international tourists: The case of Japanese inbound tourism from South Korea. *Journal of Destination Marketing & Management*, 6(1), 76-83. https://doi.org/10.1016/j.jdmm.2016.03.002

Koutoulas, D. (2015). Product, tourism. In *Encyclopedia of Tourism*, 1-4, SpringerNature, Switzerland. https://doi.org/10.13140/RG.2.1.2250.4806

Kulendran, N. (1996). "Modelling Quarterly Tourist Flows to Australia Using Cointegration Analysis." *Tourism Economics*, 2(2): 203–22. https://doi.org/10.1177/135481669600200301

Kulendran, N., & Wilson, K. (2000). Is there a relationship between international trade and international travel? *Applied economics*, *32*(8), 1001-1009. https://doi.org/10.1080/000368400322057

Kusni, A., Kadir, N., & Nayan, S. (2013). International tourism demand in Malaysia by tourists from OECD countries: A panel data econometric analysis. *Procedia Economics and Finance*, 7, 28-34. https://doi.org/10.1016/S2212-5671(13)00214-1

Le, P.N.M., Nguyen, H.T.T., & Tran, T.D.T. (2022). The triangular causal relationship between economic growth, tourism, and foreign direct investment: A case study in central Vietnam. *Asian Economic and Financial Review*, 12(7), 565-581. https://doi.org/10.55493/5002.v12i7.4555

Leitão, N.C. (2010). Does trade help to explain tourism demand? The case of Portugal. *Theoretical and Applied Economics*, XVII(3), 63-74.

Mavrommati, A., Pendaraki, K., Kontogeorgos, A., & Chatzitheodoridis, F. (2021). A panel data model of international tourism demand for Greece. *The Central European Journal of Regional Development and Tourism*, 13(3), 142–157. https://doi.org/10.32725/det.2021.024

McCann, P., Poot, J., & Sanderson, L. (2010). Migration, relationship capital and international travel: theory and evidence. *Journal of Economic Geography*, 10(3), 361-387. https://doi.org/10.1093/jeg/lbp044

Meyer, D. (2013). Exploring the duality of structure and agency – The changing dependency para- digms of tourism development on the Swahili coast on Kenya and Zanzibar. *Current Issues In Tourism*, 16(7–8), 773–791. https://doi.org/10.1080/13683500.2013.785487

Nguyen, Q.H. (2021). Impact of Investment in Tourism Infrastructure Development on Attracting International Visitors: A Nonlinear Panel ARDL Approach Using Vietnam's Data. *Economies*, 9(131), 1-19. https://doi.org/10.3390/ economies9030131

Nguyen, Q.H. (2022). Tourism demand elasticities by income and prices of international market regions: Evidence using Vietnam's data, Economies, 10(1), 1–18. https://doi.org/10.3390/economies10010001

Nunkoo, R., & Seetanah, B. (2018). Foreign direct investment and tourism development: a theoretical and empirical review. *Sage Handbook Tourism Manag*, *9*, 556-566.

Peng, B., Song, H., Crouch, G.I., & Witt, S.F. (2015). A meta-analysis of international tourism demand elasticities. *Journal of Travel Research*, *54*(5), 611-633. https://doi.org/10.1177/0047287514528283

Rosselló-Nadal, J., & He, J. (2020). Tourist arrivals versus tourist expenditures in modelling tourism demand. *Tourism Economics*, 26(8), 1311-1326. https://doi.org/10.1177/1354816619867810

Rossello-Nadal, J., & Santana-Gallego, M. (2022). Gravity models for tourism demand modeling: Empirical review and outlook. *Journal of Economic Surveys*, 36(5), 1358-1409. https://doi.org/10.1111/joes.12502

Seifi, A., Motaghi, S., Soltani Ahmadi, M., & Pletnev, D. (2020). Modeling Tourism Demand of Iran and Selected Countries (Application of ARDL Method). *Bulletin of NOSU*, 1, 167-175, (In Russ.). https://doi.org/10.29025/1994- 7720-2020-1-167-175

Shafiullah, M., Okafor, L.E., & Khalid, U. (2019). Determinants of international tourism demand: Evidence from Australian states and territories. *Tourism Economics*, 25(2), 274-296. https://doi.org/10.1177/1354816618800642

Sheldon, P. (1993). Forecasting tourism: expenditures versus arrivals. *Journal ofTravel Research*, 32(1), 13–20. https://doi.org/10.1177/ 004728759303200103

Song, H., & Li, G. (2008). Tourism demand modelling and forecasting - A review of recent research. *Tourism management*, 29(2), 203-220. https://doi.org/10.1016/j.tourman.2007.07.016

Song, H., Qiu, R.T., & Park, J. (2019). A review of research on tourism demand forecasting: Launching the Annals of Tourism Research Curated Collection on tourism demand forecasting. *Annals of Tourism Research*, 75, 338-362. https://doi.org/10.1016/j.annals.2018.12.001

Song, H., Qiu, R.T., & Park, J. (2023). Progress in tourism demand research: Theory and empirics. *Tourism Management*, 94, 104655, 1-46. https://doi.org/10.1016/j.tourman.2022.104655

Suntikul, W., Butler, R., & Airey, D. (2010). The influence of foreign direct investment on accommodation patterns in Vietnam as a result of the open-door policy. *Current Issues in Tourism*, 13(3), 261-277. https://doi.org/10.1080/13683500902937628

Tang, S., Selvanathan, E.A., & Selvanathan, S. (2007). The relationship between foreign direct investment and tourism: empirical evidence from China. *Tourism economics*, 13(1), 25-39. https://doi.org/10.5367/000000007779784498

Tomohara, A. (2016). Japan's tourism-led foreign direct investment inflows: An empirical study. *Economic Modelling*, 52, 435-441. https://doi.org/10.1016/j.econmod.2015.09.024

Ulucak, R., Yücel, A.G., & İlkay, S.Ç. (2020). Dynamics of tourism demand in Turkey: Panel data analysis using gravity model. *Tourism Economics*, 26(8), 1394-1414. https://doi.org/10.1177/1354816620901956.

UNCTAD (2007). *FDI in Tourism: The Development Dimension.* UNCTAD current studies on FDI and development. New York ; Geneva : UN

Velasquez, M.E.B., & Oh, J. (2013). What determines international tourist arrivals to Peru? A gravity approach. *International Area Studies Review*, 16(4), 357-369. https://doi.org/10.1177/2233865913505103.

Vietnam's Ministry of Culture, Sports and Tourism - Vietnam's MCST (2014) *Du lịch Việt Nam thực trạng và giải pháp phát triển [The present state of tourism in Vietnam and proposed strategies for development]*. Labor Publishing House, Ha Noi.

Vu, H.M., & Ngo, V.M. (2019). Strategy development from triangulated viewpoints for a fast growing destination toward sustainable tourism development–a case of Phu Quoc Islands in Vietnam. *Journal of Tourism and Services*, 10(18), 117-140. https://doi.org/10.29036/jots.v10i18.86

Wu, D.C., Song, H., & Shen, S. (2017). New developments in tourism and hotel demand modeling and forecasting, *International Journal of Contemporary Hospitality Management*, 29(1), 507–529. https://doi.org/ 10.1108/IJCHM-05-2015-0249

Wooldridge, J. (2002). 'Econometric analysis of crosssection and panel data, MIT press.

Xu, L., Wang, S., Li, J., Tang, L., & Shao, Y. (2019). Modelling international tourism flows to China: A panel data analysis with the gravity model. *Tourism Economics*, 25(7), 1047-1069. https://doi.org/10.1177/1354816618816167

Yerdelen-Tatoglu, F., & Gul, H. (2020). Analysis of tourism demand using a multi-dimensional panel gravity model. *Tourism Review*, 75(2), 433-447. https://doi.org/10.1108/TR-05-2019-0147

Article history: Received: 24.02.2024 Revised: 15.05.2024 Accepted: 10.06.2024 Available online: 28.06.2024