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RESEARCH ARTICLE

Macroeconomic Determinants of Tourism Demand Toward Emerging Markets

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ABSTRACT

This research provides valuable insights into the intricate dynamics influencing tourism demand in Turkey. By delving into the relationships between transportation costs, tourists' income levels, prices, the COVID-19 pandemic, and exchange rates, the study sheds light on the multifaceted nature of the tourism industry. The findings underscore the significance of various factors in shaping the tourism demand. Transportation costs and exchange rates are identified as critical determinants, exerting adverse effects on tourism demand. Higher transportation costs and unfavorable exchange rates can deter potential tourists However, income and prices emerged as positive influencers of tourism demand, suggesting that higher incomes and favorable price levels can stimulate tourist activity. The study's investigation of causal relationships through advanced statistical techniques revealed valuable insights. The unidirectional causality from transportation costs and income to tourism demand highlighted the pivotal role of these factors in driving tourist behavior. Additionally, the causal relationship between prices and the exchange rate signifies the interplay between economic conditions and pricing strategies in shaping tourism demand. Overall, this research provides a deeper understanding of the complex dynamics in the Turkish tourism market, offering valuable insights for industry stakeholders and policymakers alike.

Keywords: Tourism demand, Price levels, Exchange rate, Income, Transportation costs, Panel data, Poisson-Negative binomial regression, Panel causality
JEL Classification: C13, C33, L83, Z30

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Introduction

International tourism is an essential tool for economic development and contributes to the increasing economic diversity in many developing countries. The foreign exchange revenues generated through tourism enable the financing of budget deficits and help alleviate unemployment problems. Tourism has a close and mutual relationship with other service sectors, such as construction, trade, accommodation, transportation, and food and beverage (Dritsakis and Spiros, 2000). Tourism sector income increases social development and economic growth in the host countries (Tunçsiper and Horoz, 2023); it also benefits other affiliated sectors, resulting in even greater dynamism in the sector (Akova et al., 2011). Lejárraga and Walkenhorst (2013) emphasized the critical role and value of tourism for developing economies.

The World Tourism Organization (UNWTO, 2022) reported that overnight global arrivals were 1.5 billion in 2019. After the COVID-19 outbreak, it dropped to 400 million in 2020, but it increased by four percent to reach 415 million in 2021. International tourism earnings were1.7 billion dollars in 2019, decreasing to $638 billion in 2020 after Covid and $700-800 billion in 2021. The upward trend in volume and receipts showed that international tourism activities are crucial to global economic recovery.

There are numerous empirical studies evaluating the connection between tourism progress and economic development, the nexus between the tourism sector and foreign direct investments, and the determinants that influence tourism demand (mainly to estimate and analyze tourism demand for selected countries). The research targeted the top ten countries that had the most tourists visiting Turkiye to determine how this demand affected selected macroeconomic variables on the tourism sector. We used annual tourism data from 2000 to 2020 for the ten countries that, based on 2020 statistics, had the most tourists visiting Turkiye and general macroeconomic data for them. These top ten countries' tourist demand to visit Turkiye constituted about 60% of the total tourism demand in 2020, and these countries had sent over 24.7 million tourists by 2020.

Since the COVID-19 pandemic significantly impacted tourist demand and income of many countries (Henseler et al., 2021; Huyugüzel Kışla et al., 2023), this paper intends to show the effects of the pandemic by adding COVID-19 as a dummy explanatory variable in the empirical model.

The paper contributes significantly to elucidating and determining the measures that could be implemented to raise the volume of inbound tourists and the strategies and policies that might be applied to each country included in the analysis. One of the crucial contributions of the current research, in terms of the magnitude and aspect of the influences of the selected indicators on tourism demand, is to highlight the development of relevant policies using tools for the analyzed top ten countries' markets that sent the most tourists to Turkiye. The study's findings may help develop appropriate marketing strategies as the effects of macroeconomic variables are explored for Turkiye. Turkiye is among the top ten developing countries that host the most tourists globally. Therefore, the study's findings could be useful for Turkiye and other emerging markets policymakers. Even though similar analyses have been carried out in the field for other economies, studies focused on the countries covered in this study have not been conducted.

The paper's organization is as follows. First, related studies in literature are examined. Next, information about data sets and variables utilized in the empirical model are discussed. The third part presents the analysis methods and econometric model. The fourth part provides findings of the empirical analysis. Finally, we summarize and conclude the model findings and give the policy implications.

1. Literature Review

There have been many different modeling strategies to estimate tourism demand in the field. The majority of these studies about tourism demand modeling were conducted by using time series econometric techniques such as Kulendran & Witt (2001), Lim & McAleer (2000), Dritsakis (2004), Divisekera and

Kulendran (2006), Salleh, Othman, and Ramachandran (2007), Tavares & Leitao (2017), Shafiullah, Okafor, and Khalid (2018), Meo et al. (2018), Sharma and Pal (2020). However, other authors analyzed future preferences by building models based on a representative consumer (tourist) (see Alegre and Pou, 2006: 1345). In econometric analyses regarding international tourism demand, the demand is modeled as the explanatory variable and generally represented by the volume of tourist arrivals or tourism earnings. Independent variables used in such analyses include economic and financial variables like tourism prices, income level, exchange rate, and transportation costs (Lim, 1997; Meo et al.(2018), Witt & Witt, 1995; Shafiullah et al. (2019), Sharma and Pal (2020); Ulucak et al. (2020)) and sometimes non-economic variables such as epidemics (e.g., Wang, 2009; Cheng, 2012), terrorism (Fourie et al.(2019), war, political tensions and instability (Muroz,2007), economic sanction decisions between countries, visa issues and bureaucracy (Nadal and He (2020)). Many studies were done for different regions and countries in the World, but unanimity has yet to be gained as to a solid theoretical and practical basis for tourism demand (Song et al., 2013).

Gasmi and Sassi (2015) used a dynamic GMM panel model to explain tourism demand. Their study explored the principal explanatory variables of tourism demand for 1994-2012. The authors found that consumer loyalty significantly affected Tunisia's foreign tourism demand. The calculated elasticities of price and empirical results showed that international arrivals considered Tunisian tourism as a luxury service.

Tang et al. (2016) introduced a new perspective by using static and dynamic copula–GARCH models and tried to estimate China's dependence on exchange rate and tourism demand. They found that the exchange rate volatility was not a critical reason for China's tourism arrivals. Nevertheless, Russia exhibited negative behavior with RUB depreciation (or CNY appreciation equally) connected with a massive drop in tourist arrivals.

Yazdi and Khanalizadeh (2017) determined an international tourism demand with a gravity model for 1995-2014 by using tourist arrivals from 14 countries to

the USA. The findings revealed that the real gross domestic product, consumer price index, tourism transport infrastructure, and real exchange rate significantly explained the tourists' number.

Martins et al. (2017) examined the nexus between fundamental economic indicators and tourism demand with panel data analysis for 218 nations from 1995-2012. Research findings revealed that a global GDP per capita rise, a depreciation of the national currency, and a decrease in relative local prices increased the demand for tourism.

Tavares and Leitao (2017) determined global tourism demand in Brazil with the gravity model for 2004-2013. The study results revealed a positive nexus between exchange rate and demand in tourism.

Meo et al. (2018) estimated tourism demand factors using the NARDL method from 1980 to 2015 for Pakistan. The research findings revealed that an asymmetrical nexus between exchange rates, inflation, oil prices, and tourism demand existed.

Assaf et al. (2019) explored the dynamic of tourism demand for nine Southeast Asian countries using the BGVAR method for 1985Q1: 2014Q2. Relative consumer price indices and exchange rates were used as explanatory variables. According to research findings, the GDP, TP, or exchange rate represented spillover effects in demand for the tourism sector.

Shafiullah et al. (2019) researched the factors of global demand in the tourism sector for Australia. Global tourism demand was explained using Panel and time series methods with foreign national stocks, real exchange rate, transportation costs, and the prices of global and domestic rivals. They revealed that the nexus between explanatory factors and demand in tourism differed according to the state and region.

Using a panel gravity model, Tatoğlu and Gül (2020) analyzed tourism from 30 different economies. They examined the most visited nations using the data from

2008 to 2016. The GDP per capita as a proxy of income level for host and home nations was added to the gravity model with space between countries and several economic factors (consumer price index, GDP per capita, exchange rate, etc.). The model's findings indicated that income and trade dynamics were essential factors for tourist arrivals, and distance was negatively connected with tourism arrivals.

Nadal and He (2020) conducted tourism demand modeling by investigating the relationship between the data from 191 countries and the number and expenditures of international tourists from 1998-2016. According to the findings of fixed effects OLS panel model, there was a positive correlation between the destination economy's income and demand in tourism. At the same time, the PPP was an adverse connection to tourism demand.

Ulucak et al. (2020) investigated the demand-side determinants of Turkiye's global tourist arrival volume from 25 nations and used an augmented gravity model for the 1998-2017 period. According to the study findings, the GDP per capita, globalization, and relative exchange rate positively influenced tourism demand, whereas CPI, terrorism, household debt, and distance were negatively related.

Sharma and Pal (2020) analyzed the asymmetric connection between demand in tourism and exchange rate volatility. They set up a NARDL model in India with data from 01:2006 to 04: 2018. Their results showed that tourism demand was not symmetrically associated with real and nominal exchange rate volatility.

Finally, Bianchi and Che (2020) tried to determine hotel demand in Switzerland from 1975-to 2016 using the vector autoregression (VAR) model. The research findings divulged that there was no connection between the real GDP, hotel nights, and real exchange rate.

2. Dataset and Variables

Turkiye is one of the Mediterranean region's most beloved emerging tourism routes. As the most visited seaside tourism destination, the Turkish tourism sector

is critical to overall economic activities. According to data from 2018, Turkiye ranked sixth globally in the number of tourist arrivals while ranking 15th in tourism receipts, with total tourism receipts of $26.4 billion (UNWTO, 2020; 29). According to 2019 data from the Republic of Turkiye Ministry of Culture and Tourism (RTMCT, 2022), the tourist arrival numbers increased to 45.1 million, 15.8 million in 2020, and 29.4 million in 2021, while tourism receipts were approximately $29.5 billion before the COVID-19 outbreak, $12.1 billion in 2020, and $24.5 billion in 2021.

Lim (1997: 841) pointed out that the variables most commonly adjoined in tourism demand analyses were income levels (84%), relative prices (74%), transportation costs (55%), and foreign exchange rates (25%).

In the current study, the macroeconomic determinants used to evaluate the international tourism demand for Turkiye were income level, general price levels, exchange rate, transportation costs, and the COVID-19 pandemic effect (as a dummy variable). The paper analyzed utilizing time-series data covering the years 2000 and 2021 for the top ten origin economies with the highest inbound tourists to Turkiye in 2021. In total, there were 220 observations for each variable. The top ten nations that sent the most tourists to Turkiye constituted almost 60% of the total tourist number (see Table 1). These nations are Germany, the Russian Federation, the United Kingdom, Bulgaria, the Iran Islamic Republic, Georgia, Netherlands, France, Ukraine, and Greece. The number of countries in the econometric analyses was restricted to ten countries because of the lack of comparable data for other nations, the fact that the data was annually published, and the inaccessibility of data for other countries. Therefore, the study was limited to data from the ten countries in question; however, the same data collection method made one comparable. In 2019, 45,058,286 tourists, the highest number in the last ten years in Turkiye, was reached. After the COVID-19 outbreak, the number of tourists significantly declined in Turkiye as it did worldwide due to the stopping of international flights, restrictions, and measures for the pandemic. Therefore, the average from the last ten years was used in this analysis.

Table 1: Top Ten Countries with the Most Tourist Arrivals in Turkiye (2021 and the average for 2020-2021)*

Country	Last Ten Year's Average	Share in Last Ten Years Average (%)	Tourist Arrivals in 2021	Share (%) in 2021
Germany	4,058,717	15.8	3,085,215	12.5
Russian Federation	2,869,735	11.2	4,694,422	19
United Kingdom	1,884,719	7.3	392,746	1.6
Bulgaria	1.436,986	5.6	1,402,795	5.7
Iran, Islamic Rep.	1,226,780	5.8	1,153,092	4.7
Georgia	1,071,799	4.1	291,852	1.2
Netherlands	1,008,729	3.9	645,601	2.6
France	740,020	2.9	621,493	2.5
Ukraine	667,501	2.6	2,060,008	8.3
Greece	157,723	2.1	543,539	0.6
Total of Top Ten Countries' arrivals	15,508,526	60.3	14,506,968	58.7
Total Arrivals	25,686,064	100	24,712,266	100

***Note:** It was observed that this composition began to change due to the political and regional problems experienced since 2015. However, the first six countries were the same for the analyzed period 2000-2021; only in some years the order of the countries changed source: RTMCT (2021).

Global tourism demand, this research's dependent variable, is generally measured using the tourist arrivals number, the duration of days/nights of accommodation, or tourism receipts. For example, Akis (1998), Dritsakis (2004), and Lim and McAleer (2002) used the tourist arrival numbers to proxy the tourism demand. The current study accepted the international tourism demand as a dependent variable and described the tourist arrival numbers. The relevant data set for the study was obtained from the file "Number of Arriving Foreign Visitors According to Nationality" from the Turkish Statistical Institute's (TUIK's) database.

Income level is frequently used as an explanatory variable in tourism demand analyses. With easily retrievable information, disposable income represents per capita GDP or capita GNP (Ourfelli, 2008). According to Witt & Witt (1995), Kulendran & Witt (2001), Lim & McAleer (2002), Alegre & Pou (2006), Munoz (2007), Song, Li, Witt, and Baogang (2010), Shafiullah et al. (2019), Nadal & He (2020) income level and tourism are directly proportional. In other words, if the source country has a higher income level, the inbound tourists are associated with a higher demand for tourism services. In addition to the present income level, past income levels also affected tourism demand (Lim, 1997, p. 842). In the

present study, the per capita GDP of the ten countries – calculated according to fixed 2010 USD prices – was utilized as an indicator for income variables.

Tourism prices, among other independent variables, theoretically encompassed tourists cost for the products and services purchased during their accommodation. However, there were no price indices tourism-surroundings exclusively in many countries, including Turkiye. For this reason, the other indexes of relevant countries, such as their consumer price indices (CPI) and producer price indices (PPI), were taken into consideration (Lim, 1997; Dritsakis, 2004; Song et al., 2010; Meo et al. (2018), Shafiullah et al. (2019). In contrast to Allen, Yap, and Shareef (2009), who identified a positive nexus between tourism prices and international tourism demand, the literature showed an adverse nexus between tourism prices and global tourism demand (Witt & Witt, 1995; Alegre & Pou, 2006; Munoz, 2007; Meo et al., 2018; Shafiullah et al., 2019). If general price levels in the host country increase compared to the price levels in source nations, it is expected that tourism demand for the host country will decrease; inversely, if the general price level in the host nation decreases compared to the prices in the source country, it is expected that the tourism demand for the host country will increase. In this study, the relative price structures of six nations represented the tourism services prices. The data set for this variable was formed by using the differences in the "2010=100" Consumer Prices Indices (for all products) of the nations in this research. A rise in this variable leads to a decline in international tourism demand; inversely, a decrease in this variable relates to an increase in inbound tourism demand.

The exchange rate is an essential determinant of long-run tourism demand (Webber, 2001: 398), and international tourism demand models involved exchange rates (Tang et al., 2016). Exchange rate is one of the literatures most used macroeconomic factors for tourism and the whole economy. For example, exchange rate volatility influences foreign trade using goods and services exports and imports (Demirhan & Demirhan, 2015, p. 429). Petrović and Gligorić (2010) mentioned that real exchange rate depreciation had a meaningful, favorable long-term effect on trade equilibrium in Serbia. Tourists generally have limited information about the inflation rates of different countries; for this reason, it is

believed that when deciding where to travel, tourists are more likely to make their decision by looking at foreign exchange rates.

Consequently, models for estimating tourism demand generally consider foreign exchange rates and prices. For example, Lim and McAleer (2002), Dritsakis (2004), as well as Song et al. (2010) used foreign exchange rates as explanatory variables in their analyses. Schiff and Becken (2011) emphasized that foreign exchange rate volatility significantly influenced New Zealands tourism more than tourism prices. According to Dritsakis (2004), the nominal foreign exchange rate was the national currency equivalent of a unit of foreign currency. When the nominal foreign exchange rate was separated by the price deflator or the cost index, it provided the real effective exchange rate.

A decrease in the real effective exchange rate relates to a decrease in tourism demand; whereas, an increase in the real effective exchange rate is linked with a rise in tourism demand. A reduction in the real foreign exchange rate causes local products and services to become more expensive compared to foreign products and services, thereby increasing essential and foreign currency expenses; moreover, a rise in the real foreign exchange rate causes local products and services to become less expensive compared to foreign products and services, thereby increasing exports and foreign currency revenues. It is possible that there is an adverse connection between the real foreign exchange rate and foreign currency expenses and a favorable nexus between the real foreign exchange rate and foreign currency revenues (Ayhan, 2019). Turkiye's real effective exchange rate rises along with a decline in the Turkish Lira's (TL) value, with the relevant foreign currency unit purchasing more TLs. This means that if tourist arrivals pay less of their currency for the same services in Turkiye, it is likely to raise the tourist arrival numbers from those nations. In the current study, the Real Effective Exchange Rate variable represents the foreign exchange rate. A "2010=100" index value was used for Turkey's currency (TL), so that it would equal the weighted mean of the selected countries' foreign currency.

Transportation costs represent another variable that can significantly affect international tourism demand. Although this variable will eventually become less

important as the number of new, low-cost, and safe traveling opportunities and capabilities increases, this variable is still considered unimportant. Even if the package of tour options presented by travel agencies reduces transportation costs by providing economic/affordable travel opportunities, transportation costs continue to be an important factor when the total tourism demand and current situation are considered. In 2019, 59% of all international inbound tourists traveled by airplane, while 35% by road, 5% by sea, and 1% by rail according to the mode of transport report (UNWTO, 2021: 9). Studies generally use airplane or road travel ticket prices to represent transportation costs. However, as many countries need time series for these ticket prices, refined or crude oil prices are often used instead. According to UNCTAD (2013: 286-289), transportation sectors are directly influenced by oil prices and, hence, adversely affected by an increase in oil prices. Some researchers who used transportation costs in their analyses were Dritsakis (2004), Gasmi and Sassi (2015), Lim & McAleer (2002), Meo et al. (2018), Munoz (2007), Shafiullah et al. (2019), and Witt & Witt (1995).

Table 2: Air Distance between Istanbul and the Main Cities of the Ten Countries

Starting Point	Destination	Distance (Mile or Km)
Istanbul	Berlin	1 080 miles / 1738 km
	Moskow	1 091 miles / 1756 km
	London	1 556 miles / 2504 km
	Sofia	313 miles / 504 km
	Tbilisi	756 miles / 1217 km
	Kiev	654 miles / 1 053 km
	Amsterdam	1375 miles / 2 213 km
	Athens	349 miles / 562 km
	Paris	1405 miles / 2 261 km
	Tehran	1 270 miles / 2 043 km

Source: available at: http://www.travelmath.com/distance/

In this study, the data set was obtained based on (i) the air distance between Istanbul and the main cities of each country (Table 2) and (ii) the mean for the EIA real crude oil prices that were used to represent the transportation costs (air distance/crude oil prices). The aim was to consider the distance of these countries to Turkiye and crude oil prices. When the air distance remains the same, a jump in oil prices causes the calculated value (for air distance/crude oil prices) to decrease and cause a decrease in tourism demand;

inversely, a drop in oil prices causes the calculated value (for air distance/crude oil prices) to increase, and result in a rise in tourism demand. Usually, oil prices are used to represent this variable. However, taking the air distance into account with the oil prices allows the distance dynamic effect on tourism demand to be modeled.

Table 3: Data Explanations

Variable	Representative Variable	Code	Data Source
International Tourism Demand for Turkey	Number of Arrivals (Adjusted for Seasonal Effects and Logarithm Taken)	LnAR	TUIK (2022). Tourism Statistics, Arriving/Departing Foreign Visitors by Nationalities
Income Level of Tourist Source Countries	Per Capita GDP (Fixed 2010 $US, Expenditure Approach, Seasonally Adjusted)	Y	Eurostat (2021b), OECD (2021c), The World Bank (2021)
Tourism Prices	Consumer Prices Index 2010=100 (All Products)	TP	The data for *Germany, Iran, Turkey, and the United Kingdom* were retrieved from the Federal Reserve Bank of St. Louis (2021) and the OECD (2021a) database. *The data of the Russian Federation is retrieved from* the OECD (2021b), Federal Reserve Bank of St. Louis (2021), and The Central Bank of the Russian Federation (2021) databases. *The data on Bulgaria* is retrieved from Eurostat (2021), the Federal Reserve Bank of St. Louis (2021), The Bulgarian National Bank (2021), and The European Central Bank (2021) database. *The data of Georgia* is retrieved from The National Bank of Georgia (2021) database.
Foreign Exchange Rates	Real Effective Exchange Rate (2010=100)	ER	GEM Database, Federal Reserve Bank of St. Louis (2021), IMF (2021), The World Bank (2021), and International Financial Statistics Data.
Transportation Costs	Distance of Country to Istanbul / Crude Oil Prices	TC	*Distance* data is retrieved from http://www.travelmath.com/distance/ *Crude Oil Prices* is retrieved from The U.S. Energy Information Administration (EIA) (2021), and Imported Crude Oil Price ($/barrel, Real) is used.
COVID-19	Dummy Variable	COVID-19	*WHO database*

3. Methodology

In this study, we followed the investigations of Lim (1997) and Yazdi & Khanalizadeh (2017) and examined the relationship between International Tourism Demand for Turkiye (hereafter TD), Transportation Costs (hereafter TC), Income Level of Tourist Source Countries (hereafter Y), Tourism Prices (hereafter TP), Exchange Rate (hereafter ER), and COVID-19 dummy (subsequently D) within the panel structure (Baltagi, 2013) as following:

$$TD_{it} = \beta_0 + \beta_1 TC_{it} + \beta_2 Y_{it} + \beta_3 TP_{it} + \beta_4 ER_{it} + \beta_5 D_{it} + \varepsilon_{it} \quad (1)$$

Where *i=1,2,…10* and *t=2000,2001,…2021*

The subscript *i* and *t* respectively symbolize individual (country) and time in this model, β_0 is intercept, and β_1, β_2, β_3, β_4, and β_5 are the coefficients of explanatory factors, respectively. Lastly, ε_t represents the disturbance.

We explore the factors' time-series features before estimating the panel regression model. For this objective, we utilize Pesaran's (2007) CIPS panel unit root test and Hadri & Kurozumi's (2012) panel stationarity test. The main benefit of these procedures, also called first-generation tests, is that they enable a cross-section dependence which was used in studies like Hadri (2000), Levin et al. (2002), and Im et al. (2003). O'Connel (1998) stated that cross-section dependence between the series (group series) brought about these procedures to over-reject the null hypothesis about the unit root. To test this panel data-specific issue, we benefitted from Breusch & Pagan's (1980) LM test and Pesaran et al.'s (2008) bias-adjusted LM test. Moreover, these LM-based tests provided consistent results in cases where the time extent was broader than the individuals.

To check the cointegration in cross-section dependence across the residual, we applied Westerlund (2008) panel cointegration test. Westerlund's (2008) panel cointegration test checks the null hypothesis for the non-existence of cointegration and presents the appropriate critical values for the model, including multiple regressors. The primary benefit of this procedure is that it examines the I(1) and I(0) processes together. Through this flexibility, the Westerlund (2008) test is superior to other cointegration tests in the literature.

We applied panel Poisson and negative binomial regression methods to investigate the relationship between these variables, thoroughly employed to consider data described by the supremacy of zeros and minor rates (Greene, 2008). The second and third equations below indicate the fixed effects and include the panel Poisson regression model:

$$pr(y_{it}) = \frac{e^{-\lambda_{it}}\lambda_{it}^{y_{it}}}{y_{it}!} \quad (2)$$

$$\ln(\lambda_{it}) = x'_{it}\beta + \mu_i \quad (3)$$

In equation (2), λ_{it} denotes the average and variance of the Poisson distribution, y_{it} indicates the estimated factors vector, and x_{it} shows the independent elements vector. The symbol of μ_i denotes individual influences. In the Poisson regression model shown in equation (2), the conditional mean and conditional variance functions are assumed as they are identical. Cameron and Trivedi (1998) and Crépon et al. (1998) argued that this was a rather binding presumption, especially in practice, and a significant defect of the Poisson model. To deal with this defect, we used the negative binomial regression.

Lastly, we examined the causal connection between factors and applied the panel causality test investigated by Dumitrescu and Hurlin (2012). Their test is an alternative design (Granger, 1969) and converges consecutive methods using individual Wald statistics. Moreover, it uses the standard normal distribution and the mean statistic's semi-asymptotic distribution for a fixed T sample.

4. Empirical Findings

Table 4 represents the descriptive statistics, and Table 5 illustrates the Spearman correlation coefficients (because variables do not distribute normally; see Jarque-Bera Statistics in Table 4) across the variables. The most effective relationship with tourism demand is proxied by tourists' income level (Y), which represents foreign tourists' income, this result is similar to theoretical backgrounds. The coefficients expected from the regression models were also negative for TC and ER and positive for Y and TP, respectively.

Table 4: Summary Statistics

Statistics	P	TC	Y	TP	ER
Mean	1552203	25.58943	20707.73	109.0586	99.01508
Median	1100000	21.955	13617.49	100	98.29445
Maximum	7000000	71.95	48424.3	620.9	296.313
Minimum	136305	3.94	1420.12	25.6155	54.0592
Std. Dev.	1313599	15.63294	17124.22	68.93571	22.07718
Jarque-Bera	128.0861 ***	20.47323 ***	27.33678 ***	5273.71 ***	16626.61 ***
Observations	220	220	220	220	220

Note: *** shows the 1% significance level.

Table 5: Spearman Rank-Order Correlation Coefficient

Variables	P	TC	Y	TP	ER
P	1				
TC	-0.061	1			
Y	0.2101	0.3968	1		
TP	0.134	0.0643	-0.1363	1	
ER	-0.0001	0.1789	0.1563	0.111	1

Table 6: The Results of Cross-Section Dependence Tests

Variables	LM Test Statistics	Bias Adj. $LM_{adj.}$ Test Statistics	Results
P	468.7178 ***	44.4138 ***	**CSD**
CPI	819.9277 ***	81.4345 ***	**CSD**
ER	253.4490 ***	21.7725 ***	**CSD**
Y	578.0113 ***	55.9343 ***	**CSD**
TC	944.9994 ***	94.6183 ***	**CSD**

Note: *** shows the 1% significance level.

Table 7: CIPS Panel Unit Root Test Results

Variables	Intercept (CIPS Stat.)	Intercept & Trend (CIPS Stat.)	Results
P	-1.402	-2.678	-
ΔP	-4.001 ***	-4.016 ***	**I(1)**
CPI	1.857	-1.743	-
ΔCPI	-2.377 **	-2.744 *	**I(1)**
ER	-1.768	-1.745	-
ΔER	-3.259 ***	-3.786 ***	**I(1)**
Y	-1.806	-2.124	-
ΔY	-2.501 ***	-2.740 *	**I(1)**
TC	-4.996 ***	-5.028 ***	**I(0)**

Note: *,**, and *** show the significance level at 10%, 5% and 1% respectively.

This study investigated cross-section dependence before analyzing the variables' stationarity. We used the Breusch & Pagan's (1980) LM test. The bias-adjusted LM (hereafter $LM_{adj.}$) test was investigated by Pesaran et al.(2008) to check the cross-section dependence across ten countries' tourism demand towards Turkiye. The findings of Breusch & Pagan's LM test and Pesaran et al.'s (2008) $LM_{adj.}$ tests are illustrated in Table 6. These findings demonstrate strong evidence for cross-section dependence across these variables. For these variables, we utilized Pesaran's (2007) CIPS test with Z_A^{SPC} and Z_A^{LA} tests proposed by Hadri and Kurozumi (2012) since they consent for cross-section dependence. The findings of these panel unit root tests are presented in Table 7 and Table 8.

Table 8: Hadri&Kurozumi (2012) Panel Stationary Test Results

Variables	Z_A^{SPC} Intercept	Z_A^{LA} Intercept	Z_A^{SPC} Int. &Trend	Z_A^{LA} Int. & Trend
P	-2.433	-2.875	-1.385	-1.747
CPI	-1.603	0.292	1.591	3.853
ER	3.739	2.176	-1.158	2.107
GDP	0.221	1.329	-1.160	-1.570
TC	6.535	2.552	13.451	7.818

The results in Table.8 illustrates that the null hypothesis of unit root for all variables is accepted in nearly all states, and factors are integrated differently. These findings show that a cointegration relationship between the variables can be discovered. Before trying the cointegration connection among the variables, we investigated the cross-section dependence across the residuals and illustrated the findings in Table 8. This Table displays that we rejected the null hypothesis of no cross-section dependence across the residuals (for the cointegration model). Therefore, we used Westerlund's (2008) panel cointegration test as it considers the cross-section dependence across the residuals (called the second-generation cointegration test). Table 9 gives the panel cointegration test results. Furthermore, it illustrates that we rejected the null hypothesis of no cointegration for panel statistics *(DH_p)* in these ten countries. This finding is essential theoretically (statistical theory) and practically. It indicates that variables tourism demand, transportation cost, prices, reel exchange rate, and income level of tourists are in a synchronized relationship in the long run.

Table 9: Cross-Section Dependence and Panel Cointegration Test Results

Cross-Section Dependence Tests		
LM_{adj}. CSD Test Pesaran et al. (2008) for Cointegration Eq.	Test Statistics	24.551 ***
Weakly CSD Test Pesaran (2015) for Cointegration Eq.	Test Statistics	2.768 ***
Panel Cointegration Test		
Westerlund (2008)	DH Panel Stat. (DH_p)	4.503 ***

Note: *** shows the 1% significance level.

The dependent variable and four regressors are cointegrated in this group of countries. Lastly, we reached a long-term connection among the factors and continued the variable levels for the rest of the paper.

Before estimating the regression model, it is essential to recall that while studying panel data, individual treatment is critical. Baltagi (2008) argued that the fixed effects specification was convenient as the focal point on a particular group of N countries. Because we only concentrated on the ten tourist sender countries, we chose personal effects as fixed as we use the panel Poisson and negative binomial regression models.

We implemented Poisson and negative binomial estimators to acquire the long-run connection between variables. Table 10 illustrates the Poisson and negative binomial regression results, respectively:

- Reel exchange rate (ER), transportation cost (TC), and COVID-19 dummy negatively affect tourism demand. Therefore, the increase in the mentioned variables decreases the tourism demand,
- The income level of tourists (Y) and tourism prices (TP) have a significantly positive link to the tourism demand in Turkey. In that case, the rise in the mentioned variables brings about an increase in tourism demand,
- Attention that the real significance of whole regressions is much more considerable, as demonstrated by Wald statistics.

Table 10: Regression Results

Fixed Effect Poisson Regression			Negative Binomial Regression	
Regressors	**Coefficient**	**t Stat.**	**Coefficient**	**t Stat.**
ER	-0.3554 **	-1.84	-0.3577 **	-2.05
TC	-0.2344 ***	-3.49	-0.3168 ***	-8.59
Y	1.4504 ***	3.89	0.6952 ***	9.62
TP	0.5337 ***	4.52	0.6221 ***	10.57
COVID-19 (as Dum)	-0.9299	-6.09	-0.9560 ***	-8.56
Wald Statistics	399.94 ***		383.27 ***	

Note: ** and *** indicate the significance level at 5% and 1%, respectively

After finding the long-run nexus between transportation cost (TC), tourism demand (TD), income level of tourists (Y), tourism prices (TP), and reel exchange rate (ER), we employ the Panel Causality test of Dumitrescu and Hurlin's (2012) to investigate the pairwise causal nexus (short-run) between these factors and present them in Table 11.

Table 11: Pairwise Dumitrescu-Hurlin Panel Causality Tests

Direction of Causality	W-Stat.	Zbar-Stat.	P-Values
Reel Exchange Rate →Tourism Demand	2.2194 *	1.88394	0.0596
Tourism Demand → Reel Exchange Rate	1.22969	0.15195	0.8792
Transportation Cost →Tourism Demand	0.14628 *	-1.74401	0.0812
Tourism Demand → Transportation Cost	0.56313	-1.01452	0.3103
Income Level of Tourist →Tourism Demand	1.19392	0.08937	0.9288
Tourism Demand → Income Level of Tourists	1.12504	-0.03118	0.9751
Tourism Prices →Tourism Demand	3.24681 ***	3.68193	0.0002
Tourism Demand → Tourism Prices	0.77929	-0.63625	0.5246
Reel Exchange Rate → Income Level of Tourist	0.29985	-1.47526	0.1401
Income Level of Tourist → Reel Exchange Rate	3.24053 ***	3.67093	0.0002
Tourism Prices → Income Level of Tourist	2.76227 *	2.83397	0.0046
Income Level of Tourist → Tourism Prices	1.21027	0.11798	0.9061
Transportation Cost → Income Level of Tourist	1.60646	0.8113	0.4172
Income Level of Tourist → Transportation Cost	0.75973	-0.67048	0.5026
Tourism Prices →Reel Exchange Rate	1.78232	1.11906	0.2631

Reel Exchange Rate → Tourism Prices	1.50352	0.63116	0.5279
Transportation Cost →Reel Exchange Rate	2.96896 ***	3.19567	0.0014
Reel Exchange Rate → Transportation Cost	0.68888	-0.79445	0.4269
Transportation Cost → Tourism Prices	1.18202	0.06854	0.9454
Tourism Prices → Transportation Cost	2.04573	1.58002	0.1141

Note: * and *** indicate the significance level at 10% and 1%, respectively.

After detecting the long-run relationship (cointegration), we used the causality test to examine the short-term connection. Table 11 shows evidence for the causality relationship. The results also illustrate unidirectional causality from transportation cost, reel exchange rate, and tourism prices to tourism demand.

5. Discussion

This research examined the main economic factors of global tourism demand in Turkiye. For this purpose, we used the period between 2000 and 2021 for the first-origin nations with the highest inbound tourists to Turkiye. Tourism Demand for Turkiye (TD), Transportation Costs (TC), Income Level of Tourist Source Countries (Y), Reel Exchange rate (ER), and Tourism Prices (TP) were used as the tourism demand factors for Turkiye.

The results obtained from Westerlund's (2008) cointegration test showed a long-run relationship among the variables. The Poisson and negative binomial estimators illustrate that TC, ER, and COVID-19 dummies significantly adversely affect passengers. However, Y and TP significantly positively influence the passenger numbers. In the literature, findings on the coefficient of income were expected to be positive, such as Vanegas (2009), Crouch (1995), Akis (1998), Durbarry and Sinclair (2003), Dritsakis (2004), Munoz (2007), Wang (2009), Jintranun et al. (2011), and Cheng (2012), Tavares and Laitao(2017), Meo et al. (2018), Shafiullah et al. (2019), and Nadal and He (2020). An increase in income level in these countries is associated with increased tourist arrivals to Turkiye.

The finding on the price level was expected from the literature. In Durbarry and Sinclair (2003), Munoz (2007), Brida and Risso (2009), Wang (2009), Habibi and Rahim (2009), Vanegas (2009), Yamaura and Thompson (2015), Meo et al. (2018), and Shafiullah et al. (2019) showed that increases in the tourism price level in the home nation increased the tourism demand in Turkiye. Our estimation findings were similar to other studies mentioned in the literature review. The positive sign of the relationship regarding the tourism price indicates that a rise in the products and goods price bought by tourists in their countries is also affiliated with a rise in the global tourism demand from these countries to Turkiye.

Thus, to better understand the situation, it is necessary to interpret the effects of the price change variable and the difference in the exchange rate variable. Suppose an increase in the real exchange rate is also associated with increasing tourist numbers coming to Turkiye. In that case, it might indicate that the adverse effects stemming from price rises in Turkiye were countered/balanced by the positive outcomes associated with the foreign exchange rate.

If consumer prices increase, the living costs in foreign countries increase. Therefore, foreign tourist visits to Turkey are removed as a priority. For this reason, the rise in consumer prices abroad will induce the Turkish tourism demand.

This finding is like the adverse nexus between transportation costs and tourism demand identified by Crouch (1995), Dritsakis (2004), Munoz (2007), Brida and Risso (2009), Wang (2009), and Jintranun et al. (2011), Meo et al. (2018), and Shafiullah et al. (2019). Thus, a rise in transportation costs is linked with a reduction in the international tourism demand from countries toward Turkiye. In contrast, reducing transportation costs is related to increased international tourism demand in Turkiye. Considering that global crude oil prices have fallen considerably since June 2014, this will positively affect the increasing Turkish tourism demand.

Regarding the real exchange rate, it is expected that depreciation of the national currency compared to currencies of other nations (in other words, the

rise in the exchange rate in the home nation) will cause tourism centers to become even more appealing and increase the tourist arrivals to such nations. Tourism demand from the USA and the Eurozone to Turkiye is positively correlated with exchange rates if the host country's currency is more valuable than the Turkish Lira, then Turkiye as a tourism destination becomes more popular for them. The coefficient estimate of the real exchange rate is negative, which is like the studies of Crouch (1995), Dritsakis and Spiros (2000), Dritsakis (2004), Wang (2009), Vanegas (2009); Jintanee et al. (2011), and Cheng (2012).

6. Conclusion

Due to the significance of international tourism in ensuring economic growth, employment, increasing foreign currency reserves, improving the domestic market, and increasing competitive strength and service quality, then being able to obtain a larger share in global tourism activities is a vital concern of a country such as Turkiye. Investigating the factors that determine international tourism demand from different perspectives using various methods is critically important to enhance the theoretical and practical aspects of tourism-related activities. To reveal this issue empirically, we applied econometric techniques. Among these techniques, Poisson and negative binomial regression models allowed us to reach general results.

Our empirical findings align with theoretical expectations and are consistent with the literature: Transport costs, exchange rate, and COVID-19 dummy are negatively and significantly related to tourism demand. In contrast, the GDP per capita and inflation rates are positively correlated.

The analysis that was performed was critical. The Dumitrescu-Hurlin Panel Causality test results showed unidirectional causality from the exchange rate, total cost, and CPI to tourism demand.

Considering the empirical findings of the current study, the policy recommendations, primarily related to the ten countries analyzed, are as follows: The low transport costs are essential for the countries concerned. Therefore,

solutions should be developed to reduce transportation costs in marketing activities for these countries. Such activities could cover travel packages including accommodation, charter flights providing cheap transportation, establishing high-speed train lines, etc.

To attract tourists from the remaining countries, policy designers should develop appropriate general strategies to decrease the general price level (i.e., inflation) and specific strategies focused on declining the price of tourism services. Regarding findings related to the per capita income of the origin country, we see that an increase in this variable increases the number of arrivals from the countries included in the analysis.

If policymakers want to attract tourist arrivals, then priority should be given to those enterprises providing innovative tourism services not included in other tourism locations preferred by the individuals of the mentioned countries. These policies could include promotions or subsidies and tax benefits to encourage entrepreneurship, investments, and activities in this sector. These strategies could increase the international competitiveness of Turkish tourism companies with alternative destinations in other countries. One of the most important problems of Turkiye's tourism market is that it offers low-priced tourism services. As a result, tourism revenues per capita are below the world average. Turkiye could minimize this issue by finding new-origin countries that offer high-quality and attractive services without lowering prices.

Locations in Turkey's Mediterranean region and the need for innovation on tourist routes that are preferred more against its rival destinations in Turkiye's tourism. Incentives and regulations should be made to make it a more preferred country in tourism against Mediterranean countries such as Italy, Greece, Spain, and Portugal, which are rivals in tourism. Turkiye's historical, cultural, and natural beauty and features must be brought to the fore for international promotion. Turkiye as a reliable, safe, advanced, and modern nation needs to be introduced to the whole World, especially to countries that send more tourists to Turkiye.

In addition, businesses and entrepreneurs operating in the tourism sector should be financially supported. Tourism is a sensitive sector affected by a fragile economic structure, with fluctuating political relations, unstable trade partners, and negative changes in macroeconomic indicators.

Tourism investors and entrepreneurs should be encouraged and supported against these sensitivities. Because the tourism industry brings foreign exchange and employment contribution to Turkiye's economy, it is essential as a significant revenue potential. Therefore, the added value for support and investment in the tourism sector is high.

In future studies, other origin countries with a relatively minor number of inbound tourists could be covered in an analyses. Additionally, the effects of different macroeconomic factors on tourism demand in Turkiye should be examined. Some microdata analyses using survey data on companies and tourists could be carried out to measure the effects of policy changes. Also, similar studies could be done for countries where Turkiye is competing for tourism. In addition, a panel data analysis for country groups, including Turkiye, could investigate the effects of macroeconomic variables on tourism demand. These analyses should be repeated periodically since significant changes that affect tourism demand can be observed annually.

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