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THE EFFECT OF PRICE AND SECURITY ON TOURISM DEMAND: PANEL QUANTILE REGRESSION APPROACH

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ABSTRACT

It is of great importance for countries to increase the contribution of the tourism sector to the economy. Therefore, the authorities focus on how to increase the demand for tourism. However, the most important issue is to define the factors that influence the demand for tourism in a complex environment and this study attempts to contribute to this field. Specifically, the study examines the effects of REER (Real Effective Exchange Rate) and security conditions on tourism demand using panel data methods for 73 countries, in the tourism ranking list from UNWTO reports, over the period 2003-2018. The main results of this study show that while the effect of REER on tourism demand is negative, the security condition has a positive effect on the demand for the tourism sector. In addition to these findings which confirm the existing literature, the innovative character of the methodology – fixed-effect panel quantile regression analysis - allowed us to check whether the effects of these variables may vary in different percentiles of tourism demand. Estimation result reveals that the effect of change in REER on tourism demand increases in high percentiles. Nevertheless, the effect of the security on tourism demand decreases as percentiles increase.

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INTRODUCTION

Globalization, combined with people's drive to see and discover new places, has made tourism one of the fastest-growing sectors in the last decades (Abdou et al., 2022; Peng et al., 2014). In addition to the economic value added, foreign currency inflow, and employment benefit, the tourism sector also has extremely important effects on the social, cultural, and political lives of countries (Bayrakcı & Ozcan, 2021; Yerdelen Tatoglu & Gul, 2020).

For Rita (2000), tourism generates an enormous amount of wealth and employment both at the national and international level. In 2019, the Travel & Tourism Industry was a gigantic industry that accounts for 10.4% of the world's GDP, 10.6% of the world's jobs, and 1 out of every 4 new jobs (WTTC, 2021).

In addition to its tremendous economic contribution, tourism can also create external benefits with its multiplier effect (Baiburiev et al., 2018; Larisa Bunghez, 2016; Pascariu & Ibănescu, 2018). Thus, the tourism sector, both directly and indirectly benefits many sectors and provides growth that spreads throughout the economy (Del P. Pablo-Romero & Molina, 2013).

It is generally accepted that the size and potential of the tourism sector attract all countries. Today, many countries give special importance to the tourism sector in formulating their growth models therefore, tourism becomes a significant component of the growth of the current economy, which in turn, countries obviously aim to get the biggest share of the tourism pie (Bayrakcı & Ozcan, 2021). Thus, countries compete intensely to get more tourists (Salinas Fernández et al., 2022). At this point, it becomes crucial to determine the factors that increase the demand for tourism and the factors' effect levels. On one hand, the macroeconomic indicators are the main factors affecting tourism demand. As a matter of fact, a significant number of researchers have investigated the effects of economic factors such as GDP, REER, exchange rate, and commodity price index on tourism demand (Del P. Pablo-Romero & Molina, 2013; Martins et al., 2017; Sarin & Kaur, 2016; Sharif Karimi et al., 2018; Wamboye et al., 2020). On the other hand, there are also non-economic determinants of tourism demand such as political, psychological, demographic, sociocultural, and security-based characteristics (Bayar & Yener, 2019; Bayrakcı & Ozcan, 2021; Hai & Chik, 2011).

With the advent of COVID-19, however, things have changed. In other words, the outbreak of the COVID-19 pandemic has created

awareness of many issues. Indeed, the tourism sector is a case and important avenue to get a better understanding of the economic consequences of COVID-19. It has been clear that the disruption in the tourism sector may painfully affect the domestic economy[2].

The developments such as shutdown of many sectors and quarantine precautions in response to the COVID-19 pandemic have tremendous impact on the tourism sector. While the global economy shrank by 3.1% due to the pandemic (IMF,2022), the tourism sector shrank by 49.1% and declined 4.5 trillion USD (WTTC, 2021). In 2020, to solidify this point, World Tourism Organization (UNWTO) put it "the worst year in tourism history" (UNWTO, 2022a). This point was made to address the growth trend in both added value and employment since the Global Financial Crisis of 2008-09 (GFC). Needless to say, the recovery and positive developments in the tourism sector after the GFC had been broken by the impact of the COVID-19 pandemic (WTTC, 2021). For instance, international arrivals, which rose from 277 million in 1980 to 1.5 billion in 2019, showed a dramatic decrease of 1.1 billion in 2020 (WEF, 2022). 62 million people lost their jobs in 2020 and the employment level in the sector decreased to 272 million globally. Fortunately, by the years 2021 and 2022, sector data has contained strong signs of an upward trend again (UNWTO, 2022b).

COVID-19 has also changed the effect of many things on our lives and created changes in people's perceptions and preferences. The bottlenecks in global supply chains, difficulties in production, and the differences in the economic policies of the countries have increased the real income divergence among the citizens of different countries (Sun et al., 2022; Wildman, 2021). Therefore, the importance of price-based decision variables is expected to increase in global tourism competition.

Another factor that is expected to come to the fore in this process is the security. As is well known, the tourism sector is not based on a compulsory demand. Therefore, safety comes to the fore among the tourist destination selection criteria (Hai & Chik, 2011; Li, 2012; Ozcan & Ozmen 2016; Wamboye et al., 2020). The war in Ukraine and the tension between China and Taiwan with their global repercussions and increasing refugee influx are expected to increase security awareness in the coming period.

This study focuses on this security condition when exploring its effect for the tourism demand. To do so, it tackles effects of "REER" as an

[2] With the World Health Organization (WHO, 2022) declaration of the coronavirus epidemic as a pandemic on March 11, 2020, a significant part of the world started to implement quarantine precautions and many sectors were adversely affected by these precautions.

economic factor and "security" as a non-economic factor on tourism demand. It is also discussed according to the differing tourism demand level. In addition, GDP is added to the model as a control variable to reflect the known effects of the country's economic activities on tourism demand.

The contributions of the current study are listed as follows: i) To the best of our knowledge, the effects of the variable REER and security level with GDP as control variable on the tourism demand are analysed for the first time on a big panel data (73 countries over the 16 years), ii) the study takes the advantage of advanced econometric tools such as fixed-effects panel quantile estimation, iii) according to the panel quantile estimation result, one can see that the behaviour of the effects of the variables REER, security level, and GDP on tourism demand over the different percentiles and so, the countries in different tourism demand levels such as low, medium or high levels can make their tourism policies easier.

The remainder of this study is structured as follows. The literature review section presents the most recent studies and their particular attention to the variables affecting or being used for predicting tourism demand. Data and Methodology section considers the data and variables used in the model and explains the fitness of fixed effect panel analysis and fixed effects panel quantile estimation to address the research question. The Empirical Findings section presents the results and the related discussion. Finally, the Conclusion section provides the economic implications of the findings and concludes with a list of practical recommendations for policy-makers.

LITERATURE REVIEW

The importance of tourism demand for economic and social development is not new in the literature. For a long time, academics and policy makers studied the critical role that tourism demand and its sustainability for economic growth. A number of studies focus on the determinants of tourism demand and explored main factors such as price dynamics, income variables and security conditions. The existing literature presents findings to evaluate the impact of these main factors on tourism demand. While some examine the link between relative price and demand for tourism (Balcilar et al., 2021; Divisekera, 2003; Fernandes & Karnik, 2010; Han et al., 2006; Seetaram et al., 2016), others tackle the role of income on tourism demand (Balcilar et al., 2021; Khoshnevis Yazdi & Khanalizadeh 2017), providing further details on the nexus between price, income and tourism demand.

As for the relationship between income and security factors, a number of studies (e.g. Ghaderi et al., 2017; Hall et al., 2004; Henderson, 2003; Saha & Yap, 2014; Sonmez & Graefe, 1998) reveal the significant role that security play in tourism demand. A recent study by Nadal and Gallego (2022) goes further examining the determinants of tourism demand by including additional factors such as distance, infrastructure, current events, turmoil, bilateral agreements, common currency, weather, transportation costs, and language, as well as the price, exchange rate, and GDP. In another study, Khoshnevis Yazdi and Khanalizadeh (2017) introduced GDP, REER, and CPI as factors affecting tourism demand and found a significant relationship among the variables except with CPI. Similarly, Ghaderi et al. (2017) conducted a panel analysis using the explanatory variables used in many studies (tourism infrastructure, exchange rate, GDP, and travel cost) to reveal the importance of security indicators for tourism demand.

Imamoglu et al. (2022) focused on the impact of urbanization and industrialization on tourism revenue. In addition to these two predictors, real exchange rate and GDP are also included in the model as control variables. While the effect of all variables on tourism revenues is significant in the long run, they stated that shocks in some variables would return to equilibrium in the long run. It is recommended that the authorities, which will consider the study's results, adopt the urbanization and industrialization policies compatible with tourism and monetary policies that stabilize the real effective exchange rate.

Han et al. (2006) investigated the price-based components of the tourism flow from the USA to European countries. The main findings show that changes in tourism demand were reliant on the changes in exchange rates, prices, and expenditures. Moreover, their results stated that variables were not significant in all European countries. In a similar study, Fernandes and Karnik (2010) found that price and income changes had a significant effect on tourism demand.

In their review article, Witt and Witt (1995) discussed the variables that were previously used in various studies. They suggested using a variable as a proxy for the effect of political events in a country and they also suggested to use of purchasing power-adjusted price index, instead of an exchange rate. The empirical literature also considers the additional transformation in terms of flexibility. In so doing, studies use logarithmic values of the considered variables. Crouch (1995) rightly points out this phenomenon of elasticity by explaining it with examples. In that study, it was explained as the % reaction of tourism demand against a 1% change in

a factor. This means that the coefficients in a linear equation derived from logarithmic values give the value of the elasticities and can be compared with each other.

The present study was designed by reviewing the literature that investigates the effect of price (or an indicator showing comparative costs) and security level as prominent variables, on tourism demand. In addition to these variables, GDP is used as a control variable in many studies. A review of some prominent studies on these variables is included below.

Many variables have been used as a proxy for the destination country price level: some studies on tourism demand forecasting for a country directly assume that the exchange rates between home and destination countries represent this (Naudé & Saayman, 2005; Tavares & Leitão, 2017); some studies have suggested comparative prices or the use of CPI (Oh & Ditton, 2005; Morley, 1994). However, as in Dogru et al. (2017), there are also criticisms of the use of exchange rates and others together in the model. As a matter of fact, in the study of Khoshnevis Yazdi and Khanalizadeh (2017) about the relationships between tourism demand and some other factors such as GDP, REER, CPI, and infrastructure, they found that CPI were unrelated, but REER was found significantly related. In the study on inbound tourists in the United States, REER expressed the value of the American dollar in relation to its purchasing power and had a negative coefficient expressing an increase in the number of tourists in the case of a decrease, that is, in the case of a partial cheapening of the United States.

Dogru et al. (2017) emphasized that the simultaneous use of exchange rates and comparative prices might cause multicollinearity problems. To prevent this problem, they suggested to use of standardized price indicators (such as CPI) adjusted with exchange rates (like Witt and Witt, 1995) and they got meaningful results in their model. Seetaram et al. (2016) extensively discussed the use of CPI, real exchange rate, and exchange rate, which were insufficient in the comparison of country prices. The price competitiveness index (PCI) is suggested instead of all, as a good indicator, but it can be used in studies on a single destination or home country (Australia in the study). For example, Divisekera (2003) specifically calculated the country price indicator over the consumption of tourists with bilateral country comparisons. Working with logarithmic variables, results were obtained on the basis of both price elasticity and cross-price elasticity. However, the fact that REER is a single value for prices for each country makes it possible to use panel data with many countries. In this sense, REER

will be an indicator of the price level of a country relative to all other countries.

Balcilar et al. (2021) investigated the effect of the real exchange rate, employment rate, and GDP (as income) on outbound tourism demand. In the study, the short and long-term effects were examined by panel analysis. Findings support the short- and long-term effects of income and real exchange rates while the employment rate is effective in the short term. The study reveals that GDP per capita is a much better predictor of outbound tourism demand than employment, which may be due to the fact that GDP per capita reflects all income from economic activity, including investments, not just income from employment.

Hall et al. (2004) discussed security in a broad framework. Security concerns cover a wide range of topics, from the global to the individual. Its scope ranged from war, crime, terrorism, and political instability to issues such as human rights, the environment, drug trafficking, and epidemics (Hall et al., 2004). International tourism is yet more vulnerable to security concerns, especially with the events of the 9/11 attacks, the Iraq war, the Bali bombings, SARS, and other epidemics (Hall et al., 2004). When the security of touristic destinations deteriorates, the negative image formed in the minds of potential tourists is likely to result in cancellation of reservations and orientation to safe destinations.

Ghaderi et al. (2017) discussed the issue for developed and developing countries. They stated that in developed countries, the tourism demand was positively affected by the security level - an increase in the security level had a positive effect on tourism demand - but the effect was negative for developing countries. A decrease in security in developing countries leaded to a net increase in the incoming tourists, in other words, while losses increase in one group, the interest of a new group made up for it. In addition to security variables, infrastructure, exchange rate, GDP, and transportation costs were also used as control variables, which are also significant variables for the two country groups. While transportation costs have a negative coefficient for developing countries as expected, it has a positive coefficient for developed countries.

Saha and Yap (2014) examined the specific impacts of political instability and terrorism on tourism demand. While the study considered political stability and terrorism as separate variables, GDP, cultural heritage assets, and real exchange rate were also used as control variables. In addition to the negative effects of political instability and terrorism, political

instability also increased the negative impact of terrorism on tourism demand (moderator effect of political instability).

Henderson (2003) questioned the impact of the Bali bombing on tourism and pointed to the country's management ability of the event. From one point of view, the country's security level and the country's management capacity of it became questionable together. Lv and Xu (2017) examined the effect of corruption and various factors on tourism demand and found that the effect of corruption on tourism demand varies for various levels of corruption. Studies further supported the negative impact of low-security levels on tourism demand (Krajňák, 2021). There are also studies that show that the effects of terrorism events are seen after the violence exceeds a certain level. Besides terrorism, explanatory (control) variables such as income (e.g. real GDP per capita), tourist expenditure-based prices, binary exchange rates, transportation costs, population size, temporal variables, lagged variables, other forms of political violence, and dummy for various events variables were used in the analysis (Krajňák, 2021).

The current study is expected to contribute to the empirical literature using a unique data set of 73 countries and over the period of 2003-2018. This study fills an important gap in the literature by dealing with security and price level together. Furthermore, there is a methodological contribution of this study as it uses a panel quantile estimation method which provides a solution not to neglect the relationship among variables that may vary in different percentiles of tourism demand. The reason for selecting this method is that we use a large data set and this may cause a loss of some details such as the detection of relationship changes across the percentiles. In other words, the varying effect of the variables can be observed in countries with different tourism demand levels. Most studies produced limited results in this regard by analysing several countries separately. It is thought that the study will contribute in terms of both scope and method to further research.

ECONOMETRIC MODEL AND EMPIRICAL FINDINGS

Data and variables

The data is taken from the World Bank online database. Selection of countries is based on the tourism rankings list at UNWTO reports. The ranking list categorizes the countries in which the tourism sector constitutes a significant component of economic growth. Specifically, the data set

covers 73 countries that are on the list. Although the intention of this study was to work with a long-time interval, there is no available data for a long period to cover all countries. Hence, we consider a period (2003-2018), noting that the panel data is annual (16-year time period). The countries covered by the data are: Argentina, Armenia, Australia, Austria, Belgium, Bulgaria, Bahrain, Bahamas, Belize, Bolivia, Brazil, Canada, China, Colombia, Costa Rica, Cyprus, Germany, Dominica, Dominican Republic, Ecuador, Egypt Arab Rep., Spain, Finland, France, United Kingdom, Georgia, Hong Kong SAR China, Croatia, Hungary, Indonesia, India, Ireland, Iran Islamic Rep., Iceland, Italy, Japan, Korea Rep., Kuwait, St. Lucia, Lesotho, Luxembourg, Latvia, Morocco, Moldova, Mexico, North Macedonia, Malta, Malawi, Malaysia, Nicaragua, Netherlands, Norway, New Zealand, Panama, Philippines, Poland, Portugal, Paraguay, Romania, Russian Federation, Singapore, Slovenia, Sweden, Togo, Thailand, Trinidad and Tobago, Tunisia, Turkiye, Uganda, Ukraine, Uruguay, United States, South Africa.

Despite the studies focusing on demand forecasting for a single or a few countries (Salman et al., 2007; Uysal & Crompton, 1984; Witt & Martin, 1987), the current study aimed to obtain generalizable common factors affecting tourism demand with the panel data study such as the studies by Khoshnevis Yazdi and Khanalizadeh (2017), Naudé and Saayman (2005), Seetaram et al. (2016), Ghaderi et al, (2017), and Balcilar et al. (2021).

This study aims to determine the impact of countries' security levels and reel effective exchange rates (as price proxy) on tourism demand. For this purpose, the model can be written as $TD = f(SC, REER, GDP)$ where TD indicates Tourism Demand in the number of arrivals, SC indicates security level, REER is Reel Effective Exchange Rate, and GDP is Gross Domestic Product. "Political stability and absence of violence/terrorism index" percentile rank has been considered as a proxy for Security Level (SC). World Bank database defines the Political Stability and Absence of Violence/Terrorism as follows: “It measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Percentile rank indicates the country's rank among all countries covered by the aggregate indicator, with 0 corresponding to the lowest rank, and 100 to the highest rank” (Kaufmann et al., 2010; World Bank Metadata Glossary, PV.PER.RNK). In the study, REER has been considered as a proxy for countries' average goods and services price level that changes over time. A decrease in REER represents a depreciation of the local currency, which means goods and services become relatively cheaper. World Bank database defines the Reel Effective Exchange Rate (REER) as

follows: "It is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. For a country, the real effective exchange rate index is the nominal index adjusted for relative changes in consumer prices; an increase represents an appreciation of the local currency. In a market-based economy, households, producers, and governments' choices over resource allocation are influenced by relative prices, including the real exchange rate, real wages, real interest rates, and other prices in the economy. Relative prices also largely reflect these agents' choices. Thus, relative prices convey vital information about the interaction of economic agents in an economy and with the rest of the world" (World Bank Metadata Glossary, REER). GDP shows the size of a country not only in terms of economic activity, but also as a whole. In this sense, it is expected to have a direct relationship with the number of incoming tourists. GDP is also representative of many country-specific economic variables that are not considered. There is a need for a control variable to take into account those country-specific variables and their changes over time. For this purpose, the logarithms of the country's GDP in US dollars, which is expected to explain a large portion of the number of tourists visiting, are also included in the model (World Bank Metadata Glossary, GDP).

Model

First, we took natural logarithms of all variables and estimated panel data model as below.

$$LnTD_{it} = \beta_0 + \beta_1 LnREER_{it} + \beta_2 LnSC_{it} + \beta_3 LnGDP_{it} + \varepsilon_{it} \quad i = 1, \dots, 73$$

$$t = 2003, \dots, 2018 \qquad (1)$$

In Eq. 1, LnTD stands for natural logarithm of tourism arrivals as a proxy for tourism demand, LnREER stands for natural logarithm of reel effective exchange rate as a proxy for countries' average goods and services price level that changes over time, LnSC stands for political stability and absence of violence/terrorism index as a proxy for Security Level, LnGDP stands for natural logarithm of country's GDP in US dollars, and finally ε stands for disturbance. In this model, the expected signs of the coefficients β_2 and β_3 are positive since the higher security level in a country the higher tourism demand and also the higher economic activity leads more tourism activity. However, the expected sign of β_1 is negative since the lower relative prices in destination countries leads to higher tourism demand.

Panel time series analysis

In panel data analysis, the length of the time dimension is determinative for econometric method used. If time dimension is long, one can use panel time series estimations, if time dimension is short, panel regression models can be used to estimate the model. Our time dimension is 16 years (T=16) and one may find this length is short while others find long. Because of high number of cross sections (N=73), we firstly performed panel time series techniques to ensure the robustness of the estimations.

Cross sectional dependency

In a long panel, there could be a correlation among the units called cross section dependence. That there is a cross section dependency means that a random shock given to any country in the panel can lead to shocks to other countries. If the panel is cross sectional dependent, one can perform the second generation unit root tests to analyse stationarity.

Thus, the first step of the analyses was to test cross-section dependence. To do this, we performed Breusch-Pagan LM by Breusch and Pagan (1980); Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD test by Pesaran et al. (2008). The results can be seen in Table 1.

Table 1. *Cross sectional dependency analysis*

H₀: No cross section dependence			
Series	Test	Statistic	*P*-value
LnTD	Breusch-Pagan LM	24,078.05	0.000
	Pesaran scaled LM	295.87	0.000
	Bias-corrected scaled LM	293.44	0.000
	Pesaran CD	125.34	0.000
LnREER	Breusch-Pagan LM	13,213.71	0.000
	Pesaran scaled LM	146.01	0.000
	Bias-corrected scaled LM	143.58	0.000
	Pesaran CD	6.43	0.000
LnSC	Breusch-Pagan LM	7,214.06	0.000
	Pesaran scaled LM	63.26	0.000
	Bias-corrected scaled LM	60.82	0.000
	Pesaran CD	-0.21	0.836
LnGDP	Breusch-Pagan LM	29,527.33	0.000
	Pesaran scaled LM	371.03	0.000
	Bias-corrected scaled LM	368.60	0.000
	Pesaran CD	168.54	0.000

As seen in Table 1, only the Pesaran CD test for the variable LnSC indicates cross sectional independency but all other three tests for all

variables give evidence for cross section dependency of the panel. So, we concluded that our panel is cross sectional dependent.

Panel unit root tests

The second step is to perform panel unit root tests. Panel root tests are chosen according to the results of cross sectional dependency tests. In the case of cross section independency, the first generation unit root tests are proposed while in the case of cross sectional dependency, the second generation unit root tests are appropriate for the unit root analysis in the panel. Because of cross-sectional dependence, we performed Pesaran-CIPS test by Pesaran (2007) as a second generation unit root test. The results are given in Table 2. As seen in Table 2, all series are stationary at .10 level.

Table 2. *CIPS unit root test results*

H0: Unit root Series	Statistics	P-value
LnTD	-2.36	<0.01
LnREER	-2.20	<0.05
LnSC	-2.03	<0.10
LnGDP	-6.49	<0.01

The model with constant is used. According to AIC statistic, lag is 3 for the series LnTD, LnREER, LnGDP and 1 for the series LnSC.

Panel data regression

As a result of panel time series analyses, it is concluded that panel regression techniques could be used to estimate our model since our variables are stationary. Firstly, to decide between pooled and fixed/random effects model, we ran F test and obtained $F_{72,1092} = 274.58, P = 0.000 < .01$. According to this result, we rejected the null of equality of country factors and concluded that pooled regression model is not appropriate for estimation. The results of Hausman test ($\chi^2_3 = 7.95, P = 0.047 < .05$) indicated that fixed effect estimator is consistent at .05 level. To check heteroskedasticity, modified Wald test was performed and the null of constant variance was rejected ($\chi^2_{73} = 21602.56, P = 0.000 < .01$). Furthermore, to analyse serial correlation, we calculated modified Durbin-Watson statistic by Bhargava et al. (1982) and Baltagi-Wu LBI statistic by Baltagi and Wu (1999) and we found these statistics as 0.322 and 0.579 respectively. That both statistics were far from value of 2, meaning that disturbances were auto-correlated. Importantly, we also ran DeBenedictis-Giles Reset test by DeBenedictis and Giles (1998) to understand if the model was correctly specified. For this purpose, we obtained three statistics as

$F_{2,1162} = 0.849, P = 0.428 > .10$ for ResetS1 test, $F_{4,1160} = 2.042, P = 0.086 > .05$ for ResetS2 test and $F_{6,1158} = 1.380, P = 0.219 > .10$ for ResetS3 test. All three form of test statistics indicated that there was no model specification error in the model at .05 level. Finally, we calculated variance inflation factors (VIF) for the covariates in the model to see if the multicollinearity existed and found that maximum VIF value is 1.05 lower than the value 10 and concluded that there was no multicollinearity problem in the model. In the light of all these results of diagnostics, we used fixed effects Driscoll-Kraay estimator by Driscoll and Kraay (1998) to estimate the model in Eq. 1 since it was consistent under cross-section dependence, heteroskedasticity and serial correlation when N>T. The results of the fixed effects Driscoll-Kraay estimation can be seen in Table 3.

Table 3. *Fixed-effects Driscoll-Kraay estimation results*

Dependent Var.: LnTD	Coef.	Drisc/Kraay Std. Err.	*P*-Value
LnREER	-0.7299*	0.063	0.000
LnSC	0.1458*	0.019	0.000
LnGDP	0.7601*	0.062	0.000
Cons.	-1.0417	1.338	0.448

$F_{3,15}$=68.42, *P*-Value=0.000

*: significant at .01 level.

As seen in Table 3, the estimated model is significant ($F_{3,15} = 68.42, P = 0.000 < .01$) and also all regression coefficients are significant at .01 level ($P = 0.000 < .01$). The signs of the coefficients are as expected. The countries' reel effective exchange rates have negative and significant effects on tourism demand. A 1% increase in the reel effective exchange rate leads to a decrease of about .73% in the tourism demand. The countries' security levels have positive and significant effects on the tourism demand. A 1% increase in the security level causes an increase by for about .15% in the tourism demand. The economic levels of the countries have also positive and significant effects on the tourism demand. From Table 3, one can say that a 1% increase in GDP leads to a .76% increase in tourism demand.

Panel quantile regression

Obtaining fixed effects regression results, we ran fixed effects panel quantile regression estimation by Machado and Silva (2019) to see the behaviour of the parameters among the percentiles of the dependent variable namely tourism arrivals. Lv and Xu (2017) suggested that the assumption of fixed effect (fixed coefficient) is not valid in all country groups, and it would be more accurate to use quantile regression, based on the idea that the degree of effect might be different in countries where

tourism demand was different. Furthermore, panel quantile estimation is robust under heteroskedasticity, non-normal disturbance, and outliers. The methodology by Machado and Silva (2019) gives us the equation below.

$$LnTD_{it} = \alpha_i + X'_{it}\beta + (\delta_i + Z'_{it}\gamma)U_{it} \quad (2)$$

In Eq 2, X is the vector of independent variables (LnREER, LnSC and LnGDP), β is the vector of regression coefficients, Z is a k-vector of differentiable components of X that $Z_l = \mathcal{Z}_l(X), l = 1, \dots, k,$ α_i and δ_i are the parameters which capture individual i fixed effects with $Pr(\delta_i + Z'_{it}\gamma > 0) = 1$ and finally U_{it} are independent of X_{it} and i.i.d. To satisfy moment condition, U_{it} are normalised and it is obtained τth quantile estimation as Eq 3 where $\alpha_{it}(\tau) = \alpha_i + \delta_i q(\tau)$ is the distributional effect at quantile τ.

$$Q_Y(\tau|X_{it}) = \alpha_i + \delta_i q(\tau) + X'_{it}\beta + Z'_{it}\gamma q(\tau) \quad (3)$$

This regression in Eq 3 is estimated by using method moments-quantiles estimator (MM-QR) proposed by Machado and Silva (2019).

Table 4. *Fixed-effects panel quantile estimation results*

Dependent Var.: LnTD, Obs.=1168		Coef.	Std. Err.	*P*-Value
.1 Quantile	LnREER	-0.6940**	0.158	0.000
	LnSC	0.1899**	0.057	0.001
	LnGDP	0.8208**	0.045	0.000
.2 Quantile	LnREER	-0.7038**	0.130	0.000
	LnSC	0.1779**	0.047	0.000
	LnGDP	0.8042**	0.037	0.000
.3 Quantile	LnREER	-0.7103**	0.114	0.000
	LnSC	0.1699**	0.041	0.000
	LnGDP	0.7933**	0.033	0.000
.4 Quantile	LnREER	-0.7180**	0.100	0.000
	LnSC	0.1604**	0.036	0.000
	LnGDP	0.7802**	0.029	0.000
.5 Quantile	LnREER	-0.7260**	0.093	0.000
	LnSC	0.1506**	0.034	0.000
	LnGDP	0.7666**	0.027	0.000
.6 Quantile	LnREER	-0.7369**	0.098	0.000
	LnSC	0.1372**	0.035	0.000
	LnGDP	0.7483**	0.028	0.000
.7 Quantile	LnREER	-0.7478**	0.118	0.000
	LnSC	0.1239**	0.043	0.004
	LnGDP	0.7299**	0.034	0.000
.8 Quantile	LnREER	-0.7581**	0.146	0.000
	LnSC	0.1112*	0.053	0.035
	LnGDP	0.7145**	0.041	0.000
.9 Quantile	LnREER	-0.7694**	0.180	0.000
	LnSC	0.0973	0.065	0.136
	LnGDP	0.6934**	0.051	0.000

*: Significant at .01 level, **: Significant at .05 level.

We ran fixed effects panel quantile estimation by Machado and Silva (2019) to estimate the models in Eq 2 and 3 to see the behaviours of the parameters over the selected percentiles as 0.1, 0.2, … , 0.9 of the tourism demands. The fixed effects panel quantile estimation results are given in Table 4.

As seen in Table 4, the signs and significances of the coefficients, except the significance of the variable LnSC in 0.9th quantile regression, are in line with the estimation of the fixed-effects Driscoll-Kraay regression shows that the results are robust. All coefficients are getting lower as the percentiles increase. This means that security levels and economic activity have more significant impacts in countries with low tourism demand. However, when the absolute values of the coefficients are considered, real effective exchange rates have more important effects in countries with high tourism demand. These negative correlations between the coefficients and quantiles can be seen in Fig 1. Even in the reaching highest tourism demand, the security level of the country loses its effects on the tourism demand since the coefficient of the variable LnSC is insignificant in 0.9th quantile regression (P=0.136>.10).

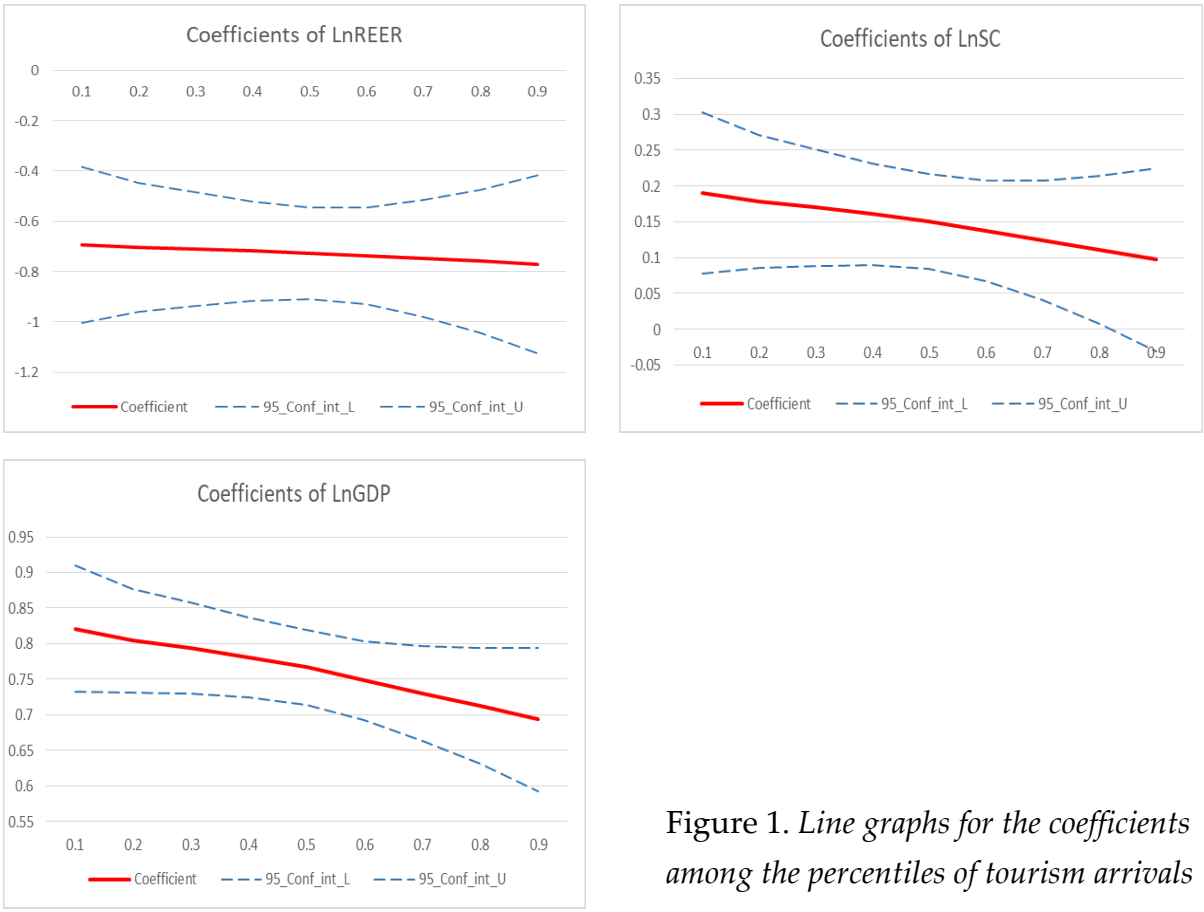

Figure 1. *Line graphs for the coefficients among the percentiles of tourism arrivals*

CONCLUSION

The importance of tourism is directly linked with the economic added value and foreign exchange inflow it creates. It also generates external benefits that provide additional services to many sectors given its potential to create employment and its impact on the social and cultural structure.

Therefore, determining the factors that affect tourism demand is of great importance for policy makers. There are many studies in the literature focusing on the factors that determine tourism demand. However, in the period that started with the Covid-19 pandemic, it was predicted that some factors such as the deterioration of global income distribution, the tension between countries Russia-Ukraine and China-Taiwan, increased military activity in relatively intense tourism demand regions, and increased refugee problem will be brought ahead of others. In this context, the ability of policymakers to manage price and security levels in tourism strategies, besides the attractions they have, will increase the competitive advantage of countries, especially in the last period.

This study has examined the effects of the security level and the price level (REER) on tourism demand. In the literature, it is seen that the number of studies dealing with the effects of these two variables on tourism together is relatively low. Therefore, the expectation that the importance of these variables will increase in the near future constituted the main motivation for this study. In addition, a few studies in the literature was carried out using the data set for 73 countries covering the years 2003-2018. The data set was first analysed by panel regression, and then another analysis was carried out with the moment-quantile estimator (Machado & Silva, 2019) method, which was introduced to the literature in 2019.

In the first stage of the study, the effects of REER and security variables on the number of tourists were investigated by panel analysis method and it was determined that these two variables had significant effects on tourism demand. Tourism demand has a positive interaction with the level of security. On the other hand, the increase in the REER variable, which characterizes the general level of prices in the target country, corresponds to a decrease in tourism demand. These findings are consistent with previous studies and the study's hypotheses. The calculated coefficients are accepted as elasticity values when working with logarithmic values. Considering the absolute values of the coefficients, a 1% decrease in price level (REER) affects tourism demand by 0.7299%, while a 1% increase in the security level (SC) affects tourism demand by 0.1458%. When the effect of GDP is questioned, it is seen that as the main determinant of

tourism demand, it has the greatest effect (0.76%) as it is expected, since it also reflects the differences between countries.

The effect of REER and Security on tourism demand has been questioned according to different percentiles of tourism demands. In this context, tourism demand levels were divided into 9 percentiles within the scope of the quantile regression method and the relative coefficients of each group were calculated. The positive effect level (coefficient) of security decreases with the increasing tourism demand in the percentiles according to the increasing tourism demand. To such a great degree that the coefficient was found to be insignificant in the last group. On the other hand, in the high percentiles of tourism demand, the negative effect of the price level increases in absolute values. In overall, it can be interpreted that the effect of the security level decreases as you go to countries with high tourism demand, and the effect of the price level becomes more pronounced. In relatively large countries with large tourism demand, the adequate level of security (with low volatility) ceases this factor to be a factor influencing tourism demand. The decreasing effect of GDP will be due to the fact that countries with high tourism demand are more homogeneous in size and its effect on tourism demand will weaken.

Limitations and Implications

In this study, a holistic evaluation was made with the tourism data of 73 countries and some inferences were made that are expected to provide decision support to policy makers. In this context, the reflections of the findings on economies and politics and the constraints encountered can be summarized as follows:

While the outputs of this study provide decision support to policy makers, businesses can also use it to find future implications. The effect of security level and prices on tourism demand is undeniable, but in most cases, it can be said that the price level is more dynamic and effective than the security level. Therefore, unless there is a situation that creates a serious security problem, strategies on pricing will be more beneficial. The issue of security needs to be addressed in the long term in order to be more stable. Analysis with quantile regression provides detailed information that differs according to the volume of tourism demand. As a matter of fact, as revealed in this study, tourism demand, which is closely related to the size of the country, also differentiates the effect of REER and security level on demand. This differentiation will also differentiate policies based on these variables from country to country. Based on the assumption that the security level is

sufficient in countries with high tourism demand, it can be said that it loses its effect and pricing becomes more prominent. The importance of security in countries with low tourism demand is also increasing due to the fact that the security level and its relatively more volatile behaviour. In this group of countries, emphasis should be placed on issues that will instil confidence in tourists.

Many countries are already aiming to diversify tourist attractions and get a bigger share of the global tourism pie. However, the potential attractiveness of each country is different from the others. While sea-sand-sun tourism is dominant for some countries, congress or health tourism may come to the fore for another group of countries. The determinants and their effects on tourism demand may differ in each type of tourism. This study was carried out without any distinction between countries. Further research could focus on countries that do best in tourist attraction, such as sea-sand-sun tourism, by creating a relatively homogeneous sample. A similar type of grouping can be done on a regional basis. Thus, differing regional priorities can be identified.

Annual data were used in the study. However, tourism demand has highly seasonal characteristics. At this point, for example, increasing the frequency by using monthly data will provide decision support to policymakers with more detailed results. Also, in some cases, it may be better to look at the lagged effect of variables because it may take time for a change in a factor to affect tourism demand.

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