



Does Financial Development, Governance and Oil Price Promote Tourism Demand in OIC Counties: Evidences from Quantile Regression

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ARTICLE INFO

Article history:

Date of submission: 12-10-2023

Date of revise: 24-01-2024

Date of acceptance: 19-02-2024

JEL Classification:

Z32

F31

E44

C23

Keywords:

Financial Development

Institutional Quality

Oil Price

International Tourism

Quantile Regression

ABSTRACT

This study analyzed the heterogeneity and nonlinear effects of financial development, governance, real exchange rate and oil price on tourism in OIC countries. We used annual panel data of 50 Islamic countries from 1996 to 2021 and apply panel quantile regression as well as fixed and random effect technique. The empirical results illustrated that across quantiles, financial development contributed to the tourism performance in all models under review. We also observed that the impact of governance indicators on tourism demand were positive and statistically significant. The estimated asymmetric model affirmed the positive effect with the weak significant power of oil price on tourism at across quantiles (except 10th), while exchange rate was negatively associated with tourism demand. Furthermore, the results of slope equality test indicated that, in many models, the relationship between tourism demand and explanatory variables was clearly heterogeneous. Finally, the asymmetric effects at different quantiles for more coefficients based on the quantile plot were confirmed.

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DOI: <https://doi.org/10.48308/jep.5.1.51>



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1. Introduction

Tourism is an industry that accounts for a large share of global economic activity; according to the UNWTO¹ (2011), the international tourist arrivals will approach 1.8 billion by 2030. The tourism industry is considered as a key factor in the development of the global economy. As stated by Tang & Tan (2013), the tourism sector uses more resources to increase tax revenues, export revenues, employment and income for the global economy. Over the past few decades, OIC (Organization of Islamic Cooperation) countries as a group have had a significant share in the tourism industry in the world. Based on SECRIC² (2020), during the period 2013-2019, tourism earnings in OIC market have been increased from 157.1 billion USD in 2013 to 181.9 billion USD in 2019, while their share in the global tourism receipts has declined slightly from 12.7% in 2013 to 12.4% in 2019. While OIC countries make up about 25 percent of the world's population, they have a small share in the world tourism industry in terms of both tourism revenues and number of tourists (about 12%). On the other hand, statistics indicate that the share of tourism industry revenues in the GDP of Islamic markets is about 3.7 percent, which is about 4.4 percent for OIC-Asian countries; this ratio is 2.5% for OIC-African countries. One of the important factors for OIC countries in tourism prosperity is the phenomenon of Islamic (halal) tourism. In particular, an increasing number of people living in OIC countries prefer to use tourism services designed in accordance with Islamic principles. Although the tourism can play a vital role in the prosperity and development of Islamic countries, the factors affecting the tourism industry in this group and the related literature have been less discussed. OIC countries are often in the groups of developing and less developed countries; they have almost the same economic structures, governance and degree of political stability. Undoubtedly, examining the role of financial, economic

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and governmental factors affecting the tourism in these countries can provide a clear perspective for policymakers.

One of the most important factors is governance and institutional quality (Saeed Meo, 2018; Detotto et al., 2021). In the recent decades, good governance has become a hot topic in the management of the public sector; this is due to the main role that the government plays in the health of society. Global studies and statistics show that good governance is one of the most basic factors in developing countries, and good governance has been described as a strong framework for development. Various studies in the previous decades have examined the role and importance of government structure and governance in increasing the growth and prosperity of countries (Sen, 1999; Olson et al., 2000). Nevertheless, very few studies have been conducted regarding the effects of governance on the tourism industry. Given that tourism is a multifaceted activity that includes various economic, social and other interest groups, a sustainable governance system is needed for sustainable development. In addition, the financial sector plays a substantial role in the global economy growth; in recent decades, a variety of studies have been conducted on the relationship between financial development and economic growth (Zhang and Zhou, 2021; Nguyen et al., 2021). However, little attention has been paid to the relationship between financial sector development and the tourism industry, especially in Islamic markets. The development of financial markets can affect the growth of the tourism industry through several channels. First, financial development can increase economic activity, often through credit expansion, investments and stock markets. (Katircioglu et al., 2017). The second channel is foreign direct investment and foreign trade. A well-functioning financial market reduces transaction costs and ensures that capital is allocated to high-yield projects that can increase growth rates (Alfaro et al., 2004). On the other hand, according to the conventional economic literature, exchange rate fluctuations or the decrease or increase in the value of money against foreign currency can be one of the effective factors in succeeding in or failing to

attract foreign tourists (Aalen et al, 2018; Agiomirgianakis et al., 2015). Studies examining the role of exchange rate as an explanatory variable on tourism have shown that the exchange rate devaluation in the destination country attracts tourist flows, while an increase in the exchange rate reduces the outflows of tourism. Other explanatory variables frequently included in tourism econometric models are oil price and their fluctuations. According to Becken (2008), changes in oil prices can harm economic and tourism activities because of the impact they have on transportation production costs, and disposable income and economic uncertainty.

Given these issues, the contributions of this paper can be grouped into several categories. First, to the best of our knowledge, no study has simultaneously established the role of the determinants of the tourism industry, including financial development, exchange rates, governance and oil prices. Second, the determinants of tourism demand in the group of Islamic countries, including OIC countries, are rarely examined; this article tries to fill this gap. Third, unlike other papers (Detotto et al., 2021; Aalen et al., 2018) that have employed panel-based regression, here we apply the panel quantile framework to investigate the asymmetric effects of explanatory variables on tourism. The panel quantile approach considers the separate response of the tourism demand to the financial development and governance at different quantiles levels of the tourism distribution. Finally, at each step, to analyze the sensitivity and accuracy of the extraction coefficients, we include influential control variables such as foreign direct investment and GDP in the base models. In this regard, the remainder of the paper is organized as follows: Section 2 explores the literature review. Section 3 presents the econometric methods and data description involved in the empirical investigation. Section 4 discusses the results. Finally, section 5 concludes the paper and highlights the policy implications.

2. Literature review

According to the economic literature, the efficiency and increase of government regulatory laws through the quality of public goods and services, as well as the regulatory framework that promotes private sector activity, can have a positive effect on economic growth, thus attracting foreign tourists and increasing revenues (Gómez et al., 2008; Detotto et al., 2021). The importance of governance quality and its influence on tourism revenue have been studied by Detotto and et al., (2021) for 100 countries between 2002 and 2012. In the framework of dynamic panel, they confirmed that higher governance quality had a positive and significant effect on tourism revenue. Further, within panel quantile regression for 62 countries, Lv and Xu (2016) found the inverted-U relationship between corruption and tourism demand distribution at the median quantiles. Also, they showed that corruption had a positive impact on the demand of tourism in countries with the most and the least corruption. Similarly, the impact of the governance index of the host country on the tourism income of developing countries has been studied by Shahabadi and Mehry (2016). Their findings indicate that there is a strong positive and significant relationship between the governance institution index, including transparency, political stability, the effectiveness of laws, the rule of law, and the fight against corruption on tourism revenue.

In connection with financial development, it can be stated that developing an efficient financial system by identifying and financing suitable business opportunities, equipping savings, covering and diversifying risk, and facilitating the exchange of goods and services can expand investment opportunities. Also, increasing the efficiency of the financial system will ultimately lead to higher economic growth by improving resource allocation, promoting investment, and accelerating capital accumulation (Creane et al., 2004); hence, financial development, such as easy turnover in the country of origin for tourists and the simple use of financial instruments to finance tourists, has an important role in increasing the development of the tourism industry (Nargesi et al., 2018). In addition, the role of development and

financial infrastructure in providing facilities and support to tourists, both in the host country and the guest, has a positive effect on the tourist demand. Development of tourism facilities and infrastructure, including the development of financial institutions, insurance, transportation and roads, development of communication and information technology, electronic money, accommodation, restaurants, public health and increase of welfare facilities, all require the development of financial markets, thus stimulating the tourism industry and its attractiveness. Using ARDL approach, Kumar et al (2023) indicate that tourism demand promotes financial development for the case of Fiji.

There are a significant number of articles using the exchange rate as an explanatory variable, usually considering it to have explanatory power in determining the international tourist demand (Aalen et al., 2018). For instance, Saeed Meo et al., (2018), using NARDL approach, showed that there was a long-run asymmetric relationship between oil prices, exchange rate, inflation, and tourism demand in Pakistan. Aalen et al., (2018) also identified the exchange rate's role in determining inbound tourist demand in Norway. In the recent years, various studies have examined the relationship between oil prices and tourism demand (Hadi, 2023). For instance, the nexus of oil prices and tourism demand has been considered by Yeoman et al., (2007). Their empirical results illustrated that as oil prices rose, it inversely affected and decreased tourism demand. The results of some studies have also shown that the relationship between oil price fluctuations and the tourism industry may be different in different countries. On the one hand, rising oil prices are pushing up inflation, which may have a worse effect on tourism demand. Therefore, tourism demand is prone to oil price fluctuations. Conversely, inflation due to high oil prices may also have a positive or productive effect on oil-producing countries. This is because the higher the price of oil, the higher the income of those countries; this, in turn, leads to an increase in demand for the tourism industry. Another factor influencing the tourism industry, which is commonly discussed in the

literature, is foreign direct investment. Foreign direct investment leads to the development of the tourism industry by providing the knowledge and capital needed to invest in infrastructure and buildings, playing the important role of transferring skill knowledge of products, techniques and training to countries (Selvanathan et al., 2012). In this regard, Keshari Jena et al., (2021) considered the impact of globalization and FDI on tourist arrival in 112 countries. They found that foreign direct investment had a positive impact on countries with stunted and flourishing tourism sector.

3. Methodology and Data

3.1. Methodology

Since, in this paper, we intended investigate the heterogeneous and asymmetric effects of explanatory variables on the shape of the conditional distribution of tourism industry in Islamic markets, quantile regression may be appropriate. From Koenker and Bassett (1978), quantile regression is an extension of the classical least squares estimation of the conditional mean to a collection of models for different conditional quantile functions. It describes a more complete description of the conditional distribution in comparison to the conditional mean analysis alone (Mahmoudinia, 2021). In the following study, it helps to achieve the complex effects of effective factors across the conditional distribution of tourism demand at the extreme 10th and 90th quantiles. On the other hand, descriptive analysis of the tourism demand variable as a dependent variable shows that it has a skewed distribution, and the Jarque–Bera normality test indicates that the distribution of this variable is not normal (the statistic is 28.3). Therefore, it is problematic to use the ordinary least squares method based on the assumption of normal distribution error terms, because it may produce misleading results. Hence, applying the quantile regression approach could help to tackle these problems. Therefore, the conditional quantile can be defined as follows:

$$TOU_{it} = \varphi_{\theta} X'_{it} + \varepsilon_{it}; \quad Quant_{\theta}(TOU_{it}|X_{it}) = \varphi_{\theta} X'_{it} \quad (1)$$

where TOU is a tourism demand as a dependent variable, X is a vector of explanatory variable including financial development, governance index, exchange rate, oil price, GDP and foreign direct investment, i denotes country, t refer to time, φ is the vector of parameters to be estimated, ε is the vector of residuals, and $Quant_{\theta}(TOU_{it}|X_{it})$ indicates the θ th conditional quantile of TOU given X . **Also**, at the θ th quantile, the quantile regression estimator is expressed by the following minimization function:

$$\min_{\varphi} \left\{ \sum_{i:TOU_i > \varphi_{\theta} X'_{it}} \theta |TOU_i - \varphi_{\theta} X'_{it}| + \sum_{i:TOU_i < \varphi_{\theta} X'_{it}} (1 - \theta) |TOU_i - \varphi_{\theta} X'_{it}| \right\}, \quad \forall \theta(0,1) \quad (2)$$

According to the equation (2), the quantile regression minimizes a weighed sum of the absolute errors, where the weights depend on the quantile estimated. In this study, estimates are based on five quantiles ($\tau = 10^{th}, 25^{th}, 50^{th}, 75^{th}$ and 90^{th}), and these percentiles are divided into three sections including: the low quantiles (10^{th} and 25^{th}), the middle quantile (50^{th}) and the upper quantiles (75^{th} and 90^{th}).

3.2. Data

In this study, we consider the asymmetric and nonlinear effects of good governance index and financial development on tourism demand in 50 sample OIC countries¹ by developing the studies conducted by Detotto et al (2021) and Saeed Meo et al (2018). Financial Development index ranked countries according to the access, depth and efficiency of their financial institutions and markets, from 1 to 100. The total number of international tourists arriving is considered as a proxy for tourism demand. **Also**, we have used i) government effectiveness, representing the quality of public services,

1. The considered 50 sample OIC countries are Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Benin, Brunei Darussalam, Burkina Faso, Cameroon, Chad, Comoros, Djibouti, Egypt, Gabon, Gambia, Guinea, Guyana, Iran, Indonesia, Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Kyrgyz Republic, Libya, Malaysia, Maldives, Mali, Morocco, Mozambique, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Sierra Leone, Sudan, Suriname, Syrian Arab Republic, Tajikistan, Togo, Turkey, Tunisia, Uganda, Turkmenistan, United Arab Emirates, Uzbekistan.

the civil service and the degree of its independence from political pressures and the validity of the government's commitment to those policies, ii) political stability, measuring the likelihood of political instability and politically motivated violence, including terrorism, and iii) the rule of law, which indicates the extent to which agents are comfortable in admitting the rules of society, in particular the standard of contract compliance, laws, property rights, and the likelihood of crime and violence, as a proxy for governance that is calculated based on Worldwide Governance Indicators (WGI). The good governance indices are in the range -2.5 to $+2.5$, and higher values represent better governance.

In addition to that, for more accurate analysis of the coefficients, we will also include influential control variables such as exchange rates, oil prices and direct foreign investment in the model. The annual data has been used for 50 Organizations of Islamic Cooperation (OIC) countries over the period of 1996–2021. The choice of time period is based on the availability of data. However, definitions, sources and symbols related to the variables under study in this article are shown in table (1). All the data sets (except oil price) are taken from the World Development Indicators (WDI), from the World Bank database.

Table 1. Definitions and sources of variables

Variable	Definition	source
<i>TOU</i>	International tourism, number of arrivals	WDI
<i>EXR</i>	Official exchange rate (LCU per US\$, period average)	WDI
<i>GFD</i>	Global Financial Development index	WDI
<i>FDI</i>	Foreign direct investment, net inflows to GDP	WDI
<i>GDP</i>	GDP per capita (constant 2015 US\$)	WDI
<i>INF</i>	Consumer price index (2010 = 100)	WDI
<i>OPE</i>	Total exports and import of goods and services to GDP	WDI
<i>OIL</i>	Global price of Brent Crude	World Energy Survey
<i>GR</i>	Government Effectiveness	Worldwide Governance Indicators

<i>PS</i>	Political stability and absence of violence	Worldwide Governance Indicators
<i>RL</i>	Rule of Law	Worldwide Governance Indicators

Note: It should be noted that all variables except GR, PS and RL are in logarithmic form.

Source: Researcher findings

Statistics of the tourism industry based on the World Bank Data (2022) indicate that between 2015 and 2020, the number of international tourism arrivals in OIC countries, as compared to the world, was about more than 10%, while this ratio was about 12% for international tourism expenditures. Moreover, in 2019, Turkey (19%), Malaysia (9.7%), UAE (9.4%), Saudi Arabia (7.5%), Indonesia (6%), Morocco (4.9%) and Egypt (4.8) had the largest inflow of international tourism in Islamic countries. From figure (1), we observed that Islamic Asian countries could account for about 81% of the total flow of tourists coming to the OIC region, while the proportion for African Islamic countries was about 17%.

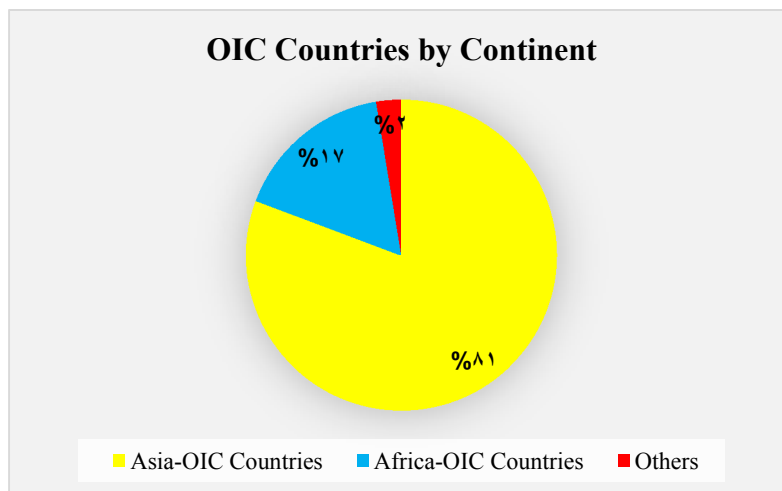


Fig1. Tourist entry in OIC countries by continent

Source: Researcher findings

However, for comparison, we have shown 5 attractive destinations for tourists in Asian and African Islamic countries in figure (2). According to this figure, the most attractive destinations for Asian countries are Turkey, Malaysia, UAE, Saudi Arabia and Indonesia, respectively, while this arrangement are Egypt, Morocco, Tunisia, Algeria and Mozambique for the Islamic markets of Africa.

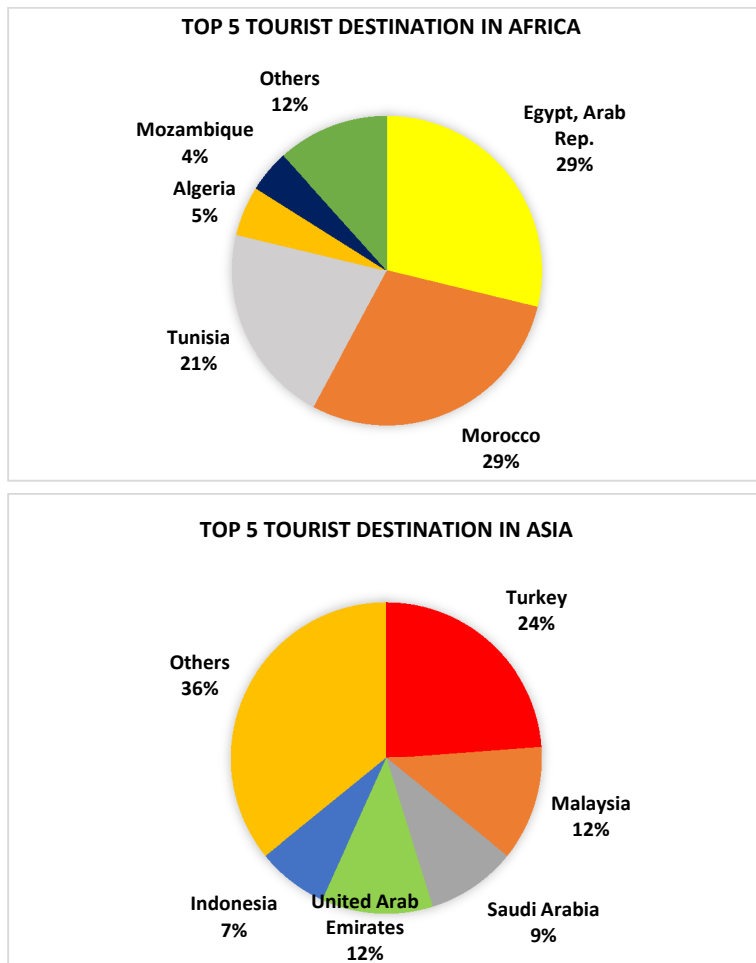


Figure (2): Top tourist destination in African and Asian Islamic countries

Source: Researcher finding

4. Empirical Results

4.1. Panel Unit Root Test

As the first step, it is crucial to clarify the stationary properties of the data series. Hence, we apply panel individual unit root tests established by Fisher type tests and Choi (2001) using ADF and PP tests (Phillips–Perron type); also, we utilize IPS (Im, Pesaran and Shin) which are widely used in panel analysis. Results, as reported in table (3), show that some variables such as FDI, GE and PS are stationary at level $I(0)$, while TOU, EXR, GFD, GDP, INF, OPE, OIL and RL are stationary at the first difference $I(1)$. Furthermore, we certify that none of the series are integrated at second order or $I(2)$. According to these results, we proceed to investigate tourism demand and explanatory variables for cointegration in order to determine if there is a long-run equilibrium relationship by implementing Kao tests based on Engle-Granger (1987) two-step (residual-based) cointegration tests, allowing for cross-section specific intercepts and homogeneous coefficients on the regressors. The results of the panel cointegration test for each model are given in the section related to that model estimation (in the following sections); they confirm that in all equations, the null hypothesis of no-cointegration is strongly rejected.

4.2. The Basic Quantile Regression Results

Table (4) illustrates the regression results based on the quantile regression method as well as the pooled regression model with fixed or random effects. Also, covariance for the quantile estimates is obtained by the Huber sandwich approach. Firstly, we consider the effects of explanatory variables on tourism demand in the framework of panel quantile regression without governance and oil price variables. Then, for more control over the coefficients, we compare those results with the panel data model, including individual fixed in which the group means are fixed or random effects which considers unobserved country specific-effects. The Hausman test is applied to select one of these effects. In addition, for a robustness check, we are faced with two models; the only difference is the existence of foreign direct investment and the trade openness.

We have named the model with FDI as model (1) and the model with OPE as model (2). In addition, the F-test for individual country effect indicates that there is country-specific effect. However, for the static panel data model, the Hausman test shows that random effect model is preferred

Table 3. Panel unit root tests results

	IPS		ADF		PP	
	Level	First difference	Level	First difference	Level	First difference
TOU	-3.19* (0.00)	-6.08* (0.00)	104.1 (0.31)	237.9* (0.00)	115.7 (0.10)	685.9* (0.00)
EXR	-5.76* (0.00)	-16.4* (0.00)	127.0* (0.00)	617.1* (0.00)	159.4* (0.00)	428.9* (0.00)
GFD	-1.08 (0.13)	-18.6* (0.00)	103.6 (0.34)	512.0* (0.00)	189.1* (0.00)	1422.1* (0.00)
FDI	-3.52* (0.00)	-17.6* (0.00)	166.7* (0.00)	522.4* (0.00)	317.1* (0.00)	1224.1* (0.00)
GDP	2.86 (0.99)	-9.55* (0.00)	97.9 (0.53)	291.7* (0.00)	88.9 (0.77)	548.5* (0.00)
INF	5.12 (1.00)	-11.1* (0.00)	72.2 (0.99)	335.5* (0.00)	152.2* (0.00)	441.9* (0.00)
OPE	-1.28 (0.10)	-17.0* (0.00)	109.4 (0.20)	496.9* (0.00)	124.4** (0.03)	820.0* (0.00)
OIL	-1.81** (0.03)	-22.7* (0.00)	93.4 (0.68)	637.8* (0.00)	63.1 (0.99)	582.9* (0.00)
GE	-2.07* (0.00)	-16.0* (0.00)	155.2* (0.00)	442.2* (0.00)	168.8* (0.00)	925.4* (0.00)
RL	-0.57 (0.28)	-13.1* (0.00)	97.9 (0.54)	396.2* (0.00)	119.0*** (0.09)	1037.8* (0.00)
PS	-2.03** (0.02)	-12.9* (0.00)	140.9* (0.00)	355.1* (0.00)	126.2** (0.03)	782.1* (0.00)

Notes: (1) *, ** and *** indicate significance at 1, 5 and 10 percent levels, respectively. (2) p-value is in parenthesis. (3) Model estimated by Newey-West automatic bandwidth selection and Bartlett kernel. Source: Researcher findings

According to table (4), the quantile regression shows that there is a significant positive relationship between global financial development and tourism demand in all quantiles for two base models (except for the 90th quantile in model 2), and this positive relationship could also be confirmed in the random effect models. For instance, statistically, in the 50th quantiles, 1% increase in financial development led to 1.01% and 0.92% increase of the tourism development in models (1) and (2), respectively. This result was also confirmed by Ohlan (2017) and Katircioglu et al (2017). This can show that in Islamic countries, an efficient financial system can easily direct capital from savers to investors and transfer resources to productive projects; this, in turn, leads to increased investment and economic growth; therefore, financial development such as easy turnover for tourists and simple use of financial instruments play an important role in the development of this industry. In addition, the exchange rate affects the tourism demand negatively in OIC countries since the estimators in all quantiles are significantly negative at 1% level. However, these coefficients are also proved in random estimator. The results indicate that the increased exchange rate is associated with the deterioration of the performance in the tourism industry. As stated by Agiomirgianakis & Sfakianakis (2012), travelers are more aware of the exchange rates they use and see it as a representation of the cost of living abroad. It can be said that exchange rate fluctuations are a determining factor in the long-term tourism demand. With the increase of the exchange rate, foreign tourist destinations become more expensive for domestic people and lead to a decrease in demand for travel.

As expected, random effect estimates indicated that there was a statistically significant positive relationship between GDP and demand of tourism at the 1% level in both models; the quantile regression also showed that there was a significant positive correlation in the 10th, 25th, 50th, 75th and 90th quantiles under review. The signs of the estimated coefficients of the different regressors considered did not change across quantiles. These results are consistent with what has been extracted by Hor & Thaiprasert (2015),

who found that GDP had a positive effect on international tourism arrivals. We also identified that in the 25th, 50th and 75th quantiles, FDI had a positive and significant effect on the attracting tourism as well as pooled estimates. This result is also consistent with the conclusion drawn by Fauzel (2021) and Craigwell & Moore (2008), finding that FDI has the potential to boost the tourism industry. It can be, therefore, said that foreign direct investment plays an important role in the development of the tourism industry by providing capital, transferring the necessary skills and knowledge to invest in the improvement of land, infrastructure and buildings. Regarding the inflation, the results largely show that it has positive coefficients in all quantiles. The results in both equations imply that a rise of inflation is associated with a boom of tourism demand in OIC countries. Furthermore, in model (2), the quantile regression shows a uniformly significant positive relationship across all quantiles (except the 10th one) between the trade openness and tourism. This positive correlation can be proved by panel data regression, which is consistent with Siddiqui & Siddiqui (2019), who found that trade openness had a significant positive impact on tourism.

However, to provide clearer asymmetric changes in the coefficients of the variables, the panel quantile regression diagrams are presented in figure (3). Variations in the coefficient of covariates over the conditional quantiles of the tourism demand distribution can be seen. Fig 3, indicates that financial development had a higher positive effect at the lower tail; also, in the upper tail this positive effect was reduced. We observed that the quantile regression coefficient of the GDP variable is increased from the lower tail at about 0.20 in the 10th quantile to 0.60 in the 80th one. At the extreme tails, FDI and exchange rate may fall out of the OLS confidence intervals, although greater parts fall within the confidence intervals. It could be easily seen that the asymmetric effects at different quantiles for more coefficients were confirmed.

Table 4. Quantile Regression Results of model (1) and (2)

Variable	10th		25th		50th		75th		90th		Fixed/Random Effect	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
GDP	0.23* (4.78)	0.27* (3.66)	0.53* (12.0)	0.55* (10.0)	0.55* (22.1)	0.56* (22.2)	0.52* (13.4)	0.52* (9.67)	0.55* (11.9)	0.53* (9.17)	0.56* (9.97)	0.52* (8.08)
EXR	-0.08* (-3.65)	-0.08* (-3.36)	-0.08* (-6.90)	-0.07* (-6.09)	-0.12* (-10.2)	-0.11* (-8.32)	-0.15* (-7.78)	-0.13* (-7.13)	-0.18* (-11.0)	-0.14* (-9.77)	-0.18* (-4.39)	-0.17* (-4.28)
GFD	1.43* (15.2)	1.33* (9.76)	1.23* (12.5)	1.12* (7.89)	1.01* (12.7)	0.92* (10.4)	0.68* (5.43)	0.62* (3.95)	0.29* (2.47)	0.27 (1.56)	0.86* (8.42)	0.93* (8.95)
INF	0.70* (7.78)	0.71* (7.37)	0.34* (3.78)	0.46* (5.09)	0.37* (5.05)	0.38* (4.55)	0.49* (5.20)	0.49* (4.75)	0.48* (7.04)	0.37* (6.54)	0.57* (11.0)	0.59* (11.6)
FDI	0.009 (0.32)	-	0.12* (3.74)	-	0.11* (3.96)	-	0.13* (3.72)	-	-0.01 (-0.45)	-	0.005* (0.33)	-
OPE	-	0.002 (1.43)	-	0.003** (2.25)	-	0.003** (2.84)	-	0.003** (2.10)	-	0.004* (2.25)	-	-0.003 (-0.36)
C	6.22* (4.95)	5.13** (2.33)	1.11 (1.15)	-0.24 (-0.15)	0.90 (1.15)	0.43 (0.54)	1.38 (1.16)	0.90 (0.52)	0.53 (0.37)	1.15 (0.64)	-0.14 (-0.10)	0.89 (0.61)
Pseudio R²	0.45	0.44	0.49	0.50	0.53	0.51	0.50	0.47	0.47	0.46	0.57	0.45
Adjusted R²	0.44	0.44	0.49	0.49	0.52	0.51	0.50	0.47	0.47	0.46		
Kao Cointegration test	Model 1 -4.26* [0.00]		Model 2 -3.22* [0.00]									
F-Limer Cross Section F							1482.1 [0.00]					
Hausman Test							8.43 [0.13]					
Heteroscedasticity test							404.3 375.8					
Durbin- Warson							1.48 1.65					

Notes: (1) *, ** and *** indicate significance at 1, 5 and 10 percent levels, respectively. (2) t-statistic is in parenthesis. (3). Prob-value is in bracket. Source: Researcher findings

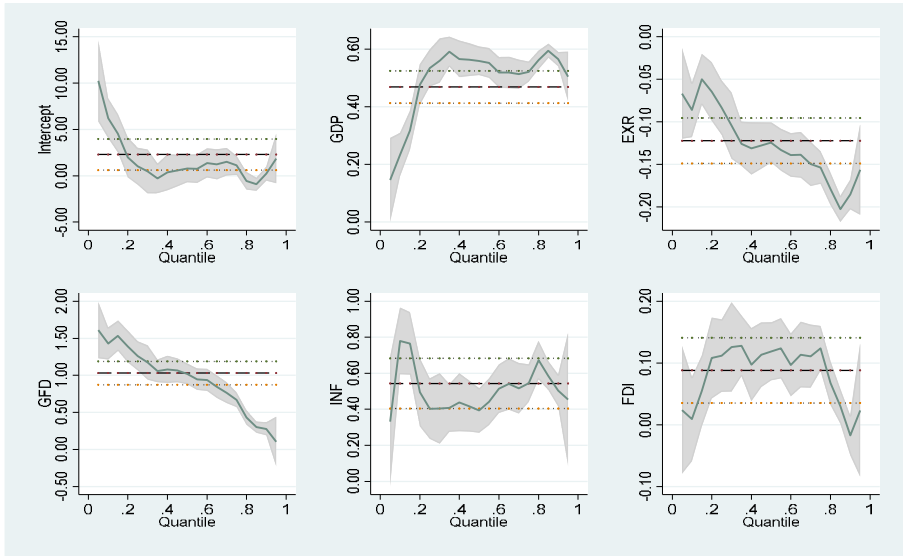


Fig 3. Quantile plots.

Note: The dotted line represents the OLS estimator. The shaded bands represent the corresponding 95% confidence intervals. Source: Researcher findings

As a robust test of heterogeneity, we utilized slope equality across quantiles, as proposed by Koenker and Bassett (1978). The results of Wald test, as can be seen from table (5), indicated that the relationship between tourism demand and explanatory variables was clearly heterogeneous except OPE. It could be clearly seen that, in the case of financial expansion and foreign direct investment, the slopes for 10th and 90th quantiles were different from those of 50th quantiles and statistically significant.

Table 5. Wald test for equality of slopes of model (1) and (2)

variable	Quantile			
	0.10 against 0.50 quantile		0.90 against 0.50 quantile	
	(1)	(2)	(1)	(2)
GDP	-0.32*	-0.25*	-0.006	0.007
	(0.00)	(0.00)	(0.89)	(0.89)
EXR	0.04	0.02	0.06*	0.04*

	Quantile			
	0.10 against 0.50 quantile		0.90 against 0.50 quantile	
	(0.13)	(0.30)	(0.00)	(0.01)
GFD	0.41* (0.00)	0.37* (0.00)	0.74* (0.00)	0.68* (0.00)
INF	0.32* (0.00)	0.41* (0.00)	-0.11 (0.17)	0.03 (0.71)
FDI	-0.10* (0.00)		0.13* (0.00)	
OPE		-0.001 (0.42)		-0.001 (0.42)

Notes: (1) *, ** and *** indicate significance at 1, 5 and 10 percent levels, respectively. (2) p-value is in parenthesis. Source: Researcher findings

4.3. Quantile Regression Results by Governance Indicators

In this section, we re-evaluate the basic model by developing and adding governance variables including government efficiency, role of law and political stability to compare the experimental results with those extracted in the previous section. To control the coefficients, the governance variables were entered into the model in three steps; hence, we estimated three new regressions. However, the regression results, as shown in table (6), indicate that in models (3) and (4), government efficiency exerted a statistically significant positive sign; so, at the median quantiles, %1 increase in GE led to a 0.62% and 0.63% increase in the tourism demand in models (3) and (4), respectively. These positive results were also confirmed in fixed effect models. In particular, in model (4), the role of law has a direct impact on the tourism development with a stronger level of significance in the median quantiles, and the impacts were heterogeneous across different quantiles. Another considerable result was the impact of political stability on tourism arrival. From table (7), it could be seen that the coefficient of PS is significant only at the 25th, 75th and 90th quantiles, while the coefficient at the

10th and median quantiles were insignificant; meanwhile, this positive correlation was confirmed in both fixed effect estimators. These results, thus, show that countries with more effective government, higher rule of law and higher political stability, or better governance in general, have better business environments, more competitive and investment environments, and a higher accumulation of physical and knowledge-based resources, like human capital, innovations and inventions. This, in turn, leads to an increase in the rate of higher economic growth and socio-economic development of the country, including the development of tourism. Furthermore, the sign of the rest of the control variables in the three models studied in this section is the same as that extracted in the previous section; this includes positive coefficients for GDP, financial development, inflation and foreign direct investment, and negative impact for exchange rate.

Figure (4) represents some interesting views of the governance indicators on tourism arrival across quantiles. In the lower tail quantiles rather than the middle and upper tail, the impact of government efficiency and political stability on tourism distribution is less but positive, while it falls out of the OLS confidence intervals. In addition, this trend is reversed for RL; so, in the lower tail, this variable has a strong positive effect on tourism development; however, in the rest of tourism distribution, this impact is almost symmetric, although greater parts fall within the OLS confidence intervals.

Table 6. Quantile Regression Results of model (3) and (4)

Variable	10th		25th		50th		75th		90th		Fixed/Random Effect	
	(3)	(4)	(3)	(4)	(3)	(4)	(3)	(4)	(3)	(4)	(3)	(4)
GDP	0.38* (5.69)	0.42* (5.99)	0.62* (10.8)	0.64* (12.0)	0.59* (23.1)	0.58* (18.5)	0.54* (16.8)	0.55* (16.9)	0.45* (9.00)	0.48* (11.8)	0.51* (6.71)	0.51* (6.79)
EXR	-0.01 (-0.65)	-0.001 (-0.03)	-0.09* (-6.86)	-0.07* (-5.28)	-0.10* (-9.23)	-0.10* (-7.70)	-0.11* (-7.23)	-0.11* (-7.52)	-0.13* (-6.16)	-0.15* (-6.82)	-0.40* (-4.90)	-0.39* (-4.71)
GFD	0.88* (4.04)	0.79* (3.79)	0.70* (3.52)	0.66* (3.37)	0.57* (5.69)	0.58* (4.94)	0.34* (3.72)	0.31* (3.32)	0.49* (3.42)	0.31* (2.75)	0.74* (6.44)	0.73* (6.34)
INF	0.61* (8.11)	0.52* (5.01)	0.39* (4.72)	0.33* (4.80)	0.33* (4.01)	0.33* (4.70)	0.49* (6.29)	0.48* (6.85)	0.37* (5.14)	0.40* (5.25)	0.73* (9.09)	0.72* (8.85)
FDI	0.007 (0.23)	0.01 (0.53)	0.11* (2.52)	0.12* (2.76)	0.14* (5.25)	0.14* (5.05)	0.16* (6.04)	0.15* (4.53)	0.04 (0.94)	0.02 (0.55)	0.007 (0.43)	0.008 (0.49)
GE	0.71* (3.50)	0.50** (2.09)	0.51* (3.97)	0.36** (2.38)	0.62* (6.58)	0.63* (5.19)	0.67* (6.29)	0.66* (4.14)	0.38** (2.44)	0.70* (3.53)	0.22* (2.85)	0.17*** (1.91)
RL	-	0.35*** (1.77)	-	0.22 (1.47)	-	0.33* (3.09)	-	0.04 (0.34)	-	0.27** (2.41)	-	0.14 (-1.41)
C	2.37 (1.21)	1.82 (0.93)	-1.67 (-1.07)	-2.22 (-1.47)	-0.29 (-0.35)	-0.21* (-0.22)	0.22 (0.22)	-0.38* (-0.37)	3.62** (2.25)	-2.59 (1.98)	1.03 (0.56)	0.97 (0.52)
Pseudo R²	0.46	0.46	0.51	0.53	0.55	0.54	0.53	0.54	0.48	0.48	0.40	0.40
Adjusted R²	0.46	0.46	0.50	0.52	0.54	0.54	0.53	0.53	0.47	0.47		
Kao cointegration test	Model 3 -2.90 [0.00]		Model 4 -2.99 [0.00]									
F-Limer Cross Section F											1342.2 [0.00]	1344.1 [0.00]
Hausman Test											15.9 [0.01]	15.3 [0.03]
Heteroscedasticity test											473.8	377.8
Durbin- Warson											1.89	1.18

Notes: (1) *, ** and *** indicate significance at 1, 5 and 10 percent levels, respectively. (2) t-statistic is in parenthesis. (3). Prob-value is in bracket. Source: Researcher findings

Table 7. Quantile Regression Results of model (5)

	10 th	25 th	50 th	75 th	90 th	Fixed / Random Effect
Variable	(5)	(5)	(5)	(5)	(5)	(5)
GDP	0.42* (5.74)	0.65* (11.7)	0.61* (17.2)	0.57* (15.9)	0.51* (13.9)	0.58* (7.51)
EXR	-0.03 (-0.64)	-0.07* (-5.57)	-0.10* (-7.39)	-0.12* (-7.48)	-0.16* (-8.55)	-0.37* (-4.49)
GFD	0.88* (4.01)	0.59* (3.02)	0.45* (4.36)	0.35* (4.28)	0.37* (3.96)	0.73* (6.39)
INF	0.67* (3.51)	0.43* (4.50)	0.39* (4.63)	0.51* (7.38)	0.56* (6.02)	0.69* (8.65)
FDI	0.02 (0.56)	0.13* (3.09)	0.12* (4.08)	0.11* (3.32)	-0.009 (-0.20)	0.01 (0.68)
GE	-0.05 (-0.21)	0.29*** (1.75)	0.36** (2.56)	0.56* (2.96)	-0.02 (-0.13)	0.12** (2.40)
RL	0.76* (3.48)	0.29** (2.25)	0.34* (3.06)	0.23** (2.32)	0.28** (2.55)	0.05 (0.49)
PS	-0.06 (-0.67)	0.11*** (1.78)	0.12 (1.49)	0.16** (1.93)	0.25* (3.13)	0.11* (2.67)
C	2.23 (0.75)	-3.88* (-2.81)	- 2.09** (-2.02)	- 1.14** (-1.02)	0.009 (0.007)	-0.70 (-0.37)
Pseudo R²	0.48	0.53	0.56	0.54	0.49	0.39
Adjusted R²	0.47	0.52	0.55	0.53	0.48	
Kao cointegration test	Model 5 -3.66 [0.00]					
F-Limer Cross Section F						1359.4 [0.00]
Hausman Test						14.07 [0.05]
Heteroscedasticity test						388.4
Durbin- Warson						1.51

Notes: (1) *, ** and *** indicate significance at 1, 5 and 10 percent levels, respectively. (2) t-statistic is in parenthesis. (3). Prob-value is in bracket. Source: Researcher findings

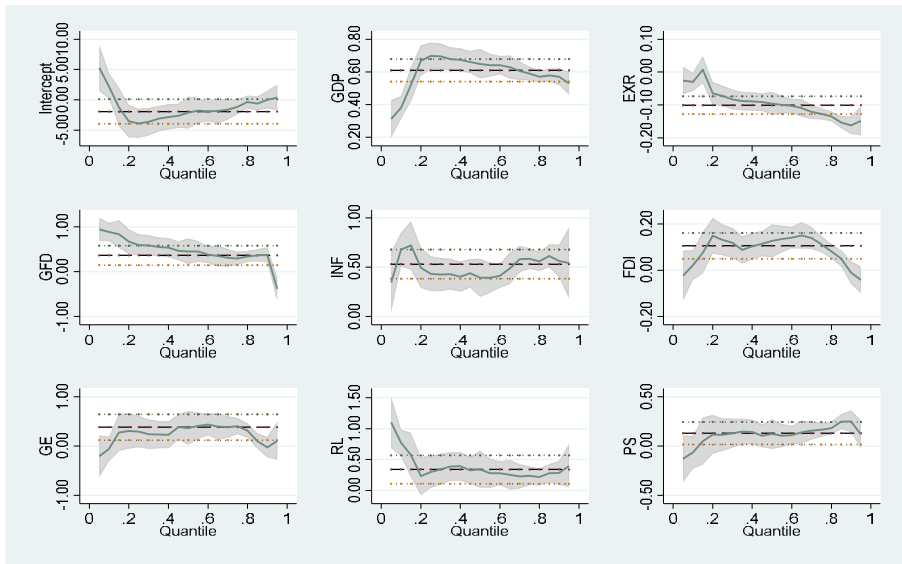


Fig 4. Quantile plots.

Note: The dotted line represents the OLS estimator. The shaded bands represent the corresponding 95% confidence intervals. Source: Researcher findings

Table (8) presents Wald tests on the equality of slopes for different quantiles. We can observe that the coefficients of FDI and GDP at lower and higher quantiles are significantly different from that at the median quantile, thus implying the heterogeneity in the effects of foreign direct investment and GDP on tourism arrival. Furthermore, the variability for RL and PS are confirmed at lower tail quantiles, while Wald test for GE shows heterogeneity at the upper tail quantile rather than the median one.

Table 8. Wald test for equality of slopes of model (5)

variable	Quantile	
	0.10 against 0.50 quantile	0.90 against 0.50 quantile
	(5)	(5)
GDP	-0.26* (0.00)	0.07*** (0.08)
EXR	0.06 (0.14)	0.06* (0.00)

	Quantile	
	0.10 against 0.50 quantile	0.90 against 0.50 quantile
<i>GFD</i>	0.42** (0.04)	0.07 (0.52)
<i>INF</i>	0.28 (0.12)	-0.17*** (0.09)
<i>FDI</i>	-0.10** (0.01)	0.13* (0.00)
<i>GE</i>	-0.45 (0.12)	0.38** (0.03)
<i>RL</i>	0.42** (0.05)	0.05 (0.65)
<i>PS</i>	-0.18*** (0.09)	-0.12 (0.17)

Notes: (1) *, ** and *** indicate significance at 1, 5 and 10 percent levels, respectively. (2) p-value is in parenthesis, Source: Researcher findings

4.4. Quantile Regression Results by Oil Price

Since an important group of OIC countries relies on oil revenues, oil and its price can play a significant role in the development or underdevelopment of the tourism industry; so in this section, we will test this correlation. Regarding oil price, we could observe that the coefficient of oil is positive with weak significant power at across quantiles (except 10th). These results, thus indicate that an increase in oil price can boost tourism industries. In addition, the coefficient value in model (7) has been increased from 0.19 in the 25th percentile to 0.22 in the 90th one, thus indicating that oil prices have more effects on the upper tail quantile of tourism distribution. As can be seen in table (9), the simultaneous quantile regression results indicate that the coefficients of FDI are statistically significant and positive in the 25th-75th quantiles. However, in the lower and upper tail (10th and 90th), the beta is insignificant. As expected, other results displayed that GDP and tourism arrival were positively related to each other and the relationship was significant at all percentiles and panel data model, thus implying that a rise of GDP is associated with improvements in tourism

arrival. We can now turn to the effect of exchange rate on tourism in OIC countries. According to table (9), exchange rate has a negative effect on tourism demand in the 25th to 90th quantiles at 1% significance level. For instance, an increase in the exchange rates of the OIC countries by 1% leads to a decrease in the tourism development by 0.08% in the 25th quantile and 0.12% in the 90th quantile based on model (6).

As in the previous section, the empirical results at all quantiles indicate that the effect of GE on tourism is positive and statistically significant. Regarding the role of low, the coefficient of RL is positive and significant at the lower quintiles (10th and 25th), while there is an insignificant relationship in median percentiles.

5. Conclusion and policymakers

Although there are several studies on the determinants of the tourism industry and its importance in the recent decades, relatively few studies have been devoted to Islamic countries. Since OIC countries have a high potential for attracting foreign tourists as well as a significant share in tourism revenues, this study addressed the role of determinants of the tourism industry in these countries. The normality tests provided significant evidence showing that most of our variables did not follow a normal distribution, thus implying the existence of heterogeneity. Using a panel quantile approach, this paper attempted to assess the nonlinear and heterogeneity impact of financial development, governance, exchange rate and oil price on tourism demand. Empirical results showed that financial development had an increasingly positive effect on tourism arrival. Another important finding of this work was that there was a significant positive relationship between the institutional quality of OIC members and tourism performance, and this relationship existed for all models and quantiles. In addition, there was a statistically significant negative relationship between exchange rate and the demand of tourism. On the contrary, at the median and upper quantiles of the conditional distribution of tourism, oil price effects were

Table 9. Quantile Regression Results of model (6) and (7)

Variable	10th		25th		50th		75th		90th		Fixed/Random Effect	
	(6)	(7)	(6)	(7)	(6)	(7)	(6)	(7)	(6)	(7)	(6)	(7)
GDP	0.39* (5.33)	0.42* (6.15)	0.63* (11.5)	0.62* (11.2)	0.58* (23.0)	0.57* (18.6)	0.55* (16.5)	0.55* (16.3)	0.45* (10.9)	0.46* (11.0)	0.45* (7.52)	0.45* (7.50)
EXR	-0.02 (-0.76)	-0.009 (-0.32)	-0.08* (-6.84)	-0.07* (-5.06)	-0.10* (-9.18)	-0.10* (-7.97)	-0.12* (-7.51)	-0.12* (-7.21)	-0.12* (-6.21)	-0.13* (-5.91)	-0.14* (-3.66)	-0.13* (-3.21)
GFD	0.84* (3.51)	0.73* (3.25)	0.70* (3.43)	0.70** (3.40)	0.56* (5.68)	0.57* (4.99)	0.31* (3.36)	0.32* (3.42)	0.44* (3.)	0.41* (3.71)	0.73* (6.74)	0.71* (6.54)
INF	0.59* (7.44)	0.49* (4.33)	0.34* (4.65)	0.30* (4.36)	0.20* (3.00)	0.19* (3.03)	0.38* (4.35)	0.38* (4.37)	0.28* (4.21)	0.30* (3.93)	0.48* (9.00)	0.46* (7.49)
FDI	0.09 (0.29)	0.02 (0.65)	0.12* (2.64)	0.12** (2.57)	0.13* (4.57)	0.13* (4.48)	0.14* (4.93)	0.14* (4.79)	0.02 (0.59)	0.03 (0.05)	-0.01 (-1.00)	-0.01 (-0.63)
OIL	0.12 (1.30)	0.09 (1.04)	0.15*** (1.66)	0.19** (2.02)	0.16** (2.48)	0.15** (2.04)	0.16** (2.15)	0.16** (2.14)	0.18** (2.21)	0.22* (2.64)	0.19* (5.61)	0.19* (5.82)
GE	0.69* (3.19)	0.50*** (1.98)	0.53* (4.08)	0.43* (2.74)	0.66* (7.13)	0.69* (5.85)	0.68* (6.51)	0.67* (4.67)	0.48* (3.40)	0.59* (3.76)	0.26* (3.46)	0.17** (2.03)
RL		0.38** (1.91)		0.18*** (1.64)		-0.06 (-0.36)		0.01 (0.14)		-0.28*** (-1.71)		0.22** (2.18)
C	1.78 (0.80)	1.37 (0.66)	-2.43 (-1.49)	-2.33** (-1.45)	-0.11 (-0.14)	-0.001 (-0.01)	-0.11 (-0.11)	-0.10 (-0.10)	3.21** (2.47)	2.83** (2.29)	1.92 (1.31)	1.94 (1.32)
Pseudo R²	0.46	0.46	0.51	0.51	0.55	0.56	0.53	0.53	0.48	0.49	0.41	0.40
Adjusted R²	0.45	0.46	0.50	0.50	0.54	0.55	0.53	0.53	0.48	0.48		
Kao cointegration test		Model 6 -2.76 [0.00]		Model 7 -2.91 [0.00]								
F-Limer Cross Section F											1361.1 [0.00]	1365.1 [0.00]
Hausman Test											9.35 [0.22]	8.83 [0.35]
Heteroscedasticity test											356.6	1714.1
Durbin- Warson											1.99	1.78

Notes: (1) *, ** and *** indicate significance at 1, 5 and 10 percent levels, respectively. (2) t-statistic is in parenthesis. (3). Prob-value is in bracket, Source: Researcher findings

most often significant. Other results confirmed that low-middle-income OIC dummy had a more positive impact on tourism performance than low-income groups. Most importantly, an increase in FDI and GDP could influence tourism industry positively at the higher level in OIC countries. Also, the results of slope equality test indicated that the relationship between tourism demand and explanatory variables was heterogeneous; further, the asymmetric effects at different quantiles for more coefficients based on the quantile plot were proved.

According to the research results, policymakers and governments need to design appropriate strategies to improve the governance index, which can provide a stable environment in Asian and African Islamic countries, thus creating incentives to attract foreign investors and tourists. In addition, it is suggested that Islamic countries, at least in the short term, continue their financial development through the expansion of credit, stock and debt markets (with the cooperation of the people of that country). This development gives entrepreneurs more incentive to invest in the tourism industry, hotel construction and other leisure activities.

Other suggestions are summarized below:

- Increasing investment in the development of tourism industry and paying more attention to tourist attractions in order to boost the economic growth of the member countries of the Islamic Conference.
- Developing sustainable tourism development projects focusing on promoting economic, financial, social, cultural and environmental incentives for tourism.
- Focusing on policy-making to expand trade and reduce the price of tourism services to attract tourists.
- It is suggested that in order to achieve higher economic growth in the country, the tourism industry should be given basic attention and the country's tourism development program should be politicized in terms of economic growth.

- Efforts to strengthen internal and external security will increase the number of tourists entering the country and subsequently increase the income in the country.
- Investing in basic tourism-related infrastructure by attracting investment and developing an efficient financial system with quality, efficiency and basic tourism-related services.

Funding

This study received no financial support from any organization.

Authors' contributions

All authors had contribution in preparing this paper.

Conflicts of interest

The authors declare no conflict of interest

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