

Chapter 10

Analysis of the Use of Digital Technologies in the Tourism Sector: Evidence from Kazakhstan



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Abstract In contemporary times, digital technologies are recognized as a vital tool in socio-economic development in many countries, as well as their prerequisite is recognized for many industries, including tourism. The growth of information and communication technologies, demand for digitalization in various economic sectors, challenges many destinations towards the introduction and development of digital technologies in the tourism sector. In this context, the objective of the present book chapter is to explore the current state of the digital technology application in the tourism industry and identify the limitations and problems associated with their implementation in the case of Kazakhstan, as an emerging and promising tourism destination. Using the gravity model, we examine the impact of information and communication technology on the tourism demand of Kazakhstan for the period of 2000–2018. The secondary data has been compiled and decomposed from international organizations, the ministries, national and regional authorities of Kazakhstan. The study updates traditional policy implications and provides remarkable recommendations for applications of digital technologies in the tourism development of the country.

Keywords Technology · Digital · Tourism · Analysis · Kazakhstan

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Introduction

In the last decades, information and communication technology (ICT) has become the main resource to drive the tourism industry in developing and developed countries. The involvement of ICT in economic activities leads to many advantages, especially in the tourism sector. Specifically, tourism products and services are more competitive and become available to purchase by the internet. ICT intensifies the tourism sector more competitively as a result, it reduces the price of goods and attracts more tourists to a destination. The positive effect of ICT on tourism demand are highly studied in the literature (Shehzad et al., 2019; Rehman et al., 2020). Few studies have addressed the question of how ICT leads to an increase in the volume of tourist arrivals and departures in the destination and origin countries. The impact of ICT on tourist arrivals from the perspective of destination and origin countries remains ambiguous in the tourism literature (Wahab, 2017).

Thus, this study analyzes the effect of ICT on international tourist arrivals to Kazakhstan from 122 countries of origin for the period of 2000–2018 using the traditional gravity model. The study estimates the tourism demand of Kazakhstan to the extent to which the development of ICT in the origin and destination countries could encourage the number of international visitors in Kazakhstan. Static balanced panel data set of 122 countries over the ninetieth-year periods. The gravity model is estimated using a static panel estimator. The obtained result presents practical implications and a novel contribution to the development of tourism in the region. Kazakhstan is a leading destination in Central Asia with over 8 million tourist arrivals in 2019. On the path of the Silk Road, Kazakhstan attracts a thousand international tourists with its cultural and natural heritage sites. The tourism sector contributed to the economic growth of Kazakhstan by 5.2% in 2019 (UNWTO, 2019), Kazakhstan placed 52nd out of 176 countries in the development of information and communication technologies in 2017 (ITU, 2021). The process of digitization of the tourism sector in Kazakhstan is under the influence of trends, which refer not only to the domestic tourism business but also to the number of global trends.

Literature Review

It is widely recognized that tourism is one of the most important industries in the world, playing an essential role in improving the economic growth and sustainable development of many countries worldwide. Tourism makes a significant contribution to the world's GDP by 10% and constitutes 10% of the world's total jobs, as one of the largest employers (UNWTO, 2020). Tourism influences social development and contributes to the preservation of cultural and historical heritage. Therefore, many countries attempt to improve their economic situation by focusing on tourism as a potential source of economic diversification and enhancement.

One of the important segments of the tourism industry is E-tourism which is associated with the use of ICT by tourists and service providers. According to the estimations of the World Economic Digital Transformation Initiative (WEF, 2018), digitalization in travel and tourism is expected to create up to USD 305 billion of value for the industry through increased profitability from 2016 to 2025. Undoubtedly, the expansion of the digital platform will influence the tourism industry. Analyzing the implementation of ICT practices in Asian destinations, it can be seen the benefits and advantages (Shrestha & Jeong, 2016). Other authors also indicated that there is a positive correlation between tourism demand and e-tourism (Buhalis, 2003; Buhalis & Deimezi, 2004; Mihajlovic, 2012).

Ramos and Rodrigues (2013a) in their turn explored the importance of ICT for tourism demand in developing countries from 1975 to 2010 and concluded that internet users and the ratio of government expenditures in ICT to GDP had positive and significant effects on the tourism demand in these countries. Bethapudi (2013) investigated the effect of ICT on the tourism industry in India and showed that all the ICT indices have positive and significant impacts on tourist arrival to India. Rajamohamed (2016) found out that ICT has a positive and significant effect on tourism in Thailand. Bekteshi and Bekteshi (2017) investigated the influence of ICT indices on the tourism sector in Albania during 2015 and found out a positive correlation between ICT quality and the tourism demand.

While other researchers analyzed the impact of ICT on small and medium tourism enterprises of Middle Eastern countries and stated that the possibility to access the internet and other tools has a positive influence on the tourism demand. They reinforced the role of ICT in companies, reporting that it may help economic sectors to improve the competitive status, quality process and reduce the costs (Feshari, 2017).

As can be seen from the analysis above and several case studies, and application of ICT in the tourism sector at the macro and micro levels, positively influence tourism demand at a destination. Nevertheless, some studies revealed that the relationship between ICT indices and international tourism has not yet been considered empirically in a developing countries. This is the case of a developing country like Iran (Karimidizboni, 2013). Author of research states (Sadr, 2013) that ICT enables effective data processing and communication, organizational benefit, and provides enormous capabilities for consumers. ICT tools have facilitated business transactions in the industry by networking with trading partners, distribution of product services and providing information to consumers across the globe. On the other hand, consumers are also using online tools to obtain information and plan their trip and travel. Information is the key element in the tourism industry.

It is also the case of Kazakhstan, an emerging tourist destination with great potential and offer for various types of visitors. However, due to several challenges tourism is not yet in its full exploration and is the subject of scientific analysis. Existing challenges in the country such as the lack of marketing strategies, the infrastructure quality, a lack of professionals in the tourism and hospitality sectors, the transport connection between regions, environmental issues result in difficulties affecting the tourism sector development (Abubakirova et al., 2016; Erdavletov & Koshkimbaeva, 2006; Ramazanova et al., 2019a; Syzdykbayeva et al., 2015).

Despite a limited number of studies conducted about ICT in tourism, the authors recognize the information support for the tourism business and its digitalization are a strategic resource that ensures the development of internal and external tourism (Ospanov & Satybaldinova, 2020). The researchers investigated the main directions and trends of digitalization in tourism, to identify technologies for the implementation of digital tourism in Kazakhstan. Garkavenko & Tiberghien (2015) conducted interviews with tourism businesses in Kazakhstan and revealed that the majority of tourism businesses stated the advantage of the implementation of ICT. However, the authors pointed out that the introduction of ICT technologies in tourism businesses in Kazakhstan is low compared to western countries and one of the reasons can be a lack of qualified staff in tourism with skills and competencies in IT. In their turn, Ziyadin et al. (2019) stated the importance of creating a competitive tourism market with adequate infrastructure, well-connected transportation services among regions, tourist attractions and entertainments, as well as effective information and communication tools. The authors reinforce the introduction of ICT, in particular mobile solutions in event organizational management, which can facilitate networking during the event, assist with navigation and information search among other advantages.

Although few studies attempted to explore ICT application in tourism or its impact, a lack of studies have been observed in the relationship between tourism demand and application of ICT in the tourism sector. Hence, to fill this gap, the present chapter of the book aims to identify the ICT factors influencing tourism demand in Kazakhstan for the period of 2000–2018.

Tourism Sector in Kazakhstan

Recognizing the role of tourism as one of the world's largest economic industries, stimulating new economic activities, several developing countries prioritize tourism as one of the essential tools of economic and social growth. This is the case of the Republic of Kazakhstan, which is an emerging and still unexplored destination for visitors.

The tourism activity is mainly based on natural attractions (such as its varied and unique geographical landscapes, natural parks, flora and fauna), together with an exquisite and authentic cultural heritage (Kuttybayeva, 2015). Kazakhstan, being an unexplored and emerging tourist destination, represents an interesting case study, due to its history, culture, hospitality, geographical position, size, and heritage (Ramazanova et al., 2019b).

The number of international tourist arrivals increased to 8,515,000 million in 2019 and 8,789,000 in 2018 (Fig. 10.1). Kazakhstan was the host of the international exhibition Expo 2017, called Future Energy 2017, which enhanced the country's recognition as a tourist destination.

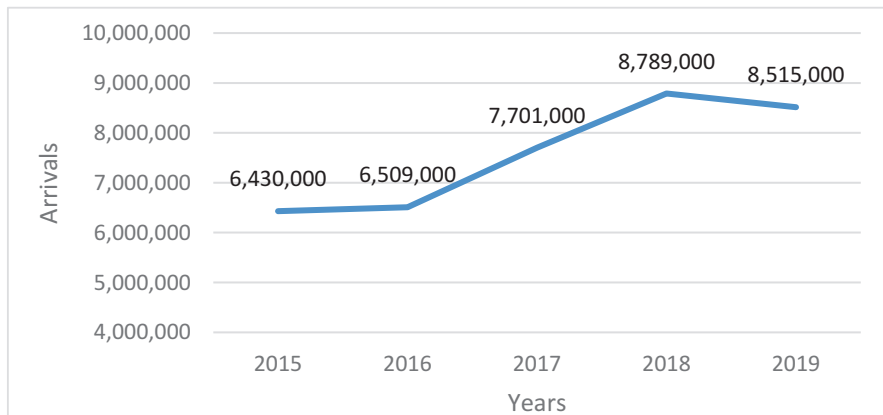


Fig. 10.1 Total arrivals to Kazakhstan from 2015 to 2019 (Source: UNWTO, 2020)

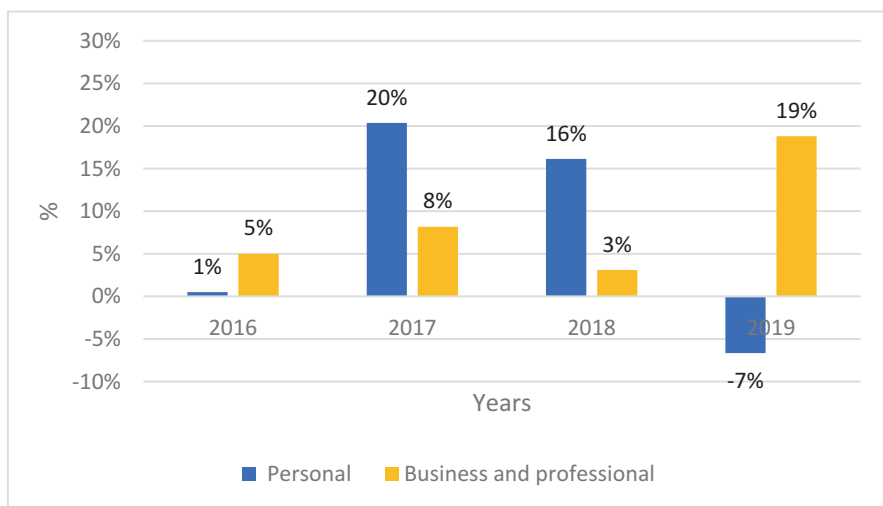


Fig. 10.2 Arrivals by the main purpose of travel (Source: UNWTO, 2020)

However, it should be noted that according to experts, the country uses its tourist potential only by 10–15% and, as a result, its ranks is lower compared to other destinations in terms of income from inbound tourism (Sheikh & Suyunchaliyeva, 2019).

Tourism literature defines two main groups of the purpose of the trip such as personal and business and professional. As can be seen in Fig. 10.2 personal purpose which usually includes leisure is the main purpose of visit in 2017 and 2018. However, it is interesting to note, that in 2019 the personal motives data

showed a negative trend, while business purpose has significantly increased to 19% compared to 2018 (3%). This can be explained by the positive impact of the organized exhibition in 2017, which has attracted a business interest among the foreigners.

In the case of domestic tourism, a relatively slight growth can be observed during the 2015–2018 years, which represents 5% of the average annual growth. However, in 2019 the number of domestic trips has decreased to 15% (Fig. 10.3).

In the case of outbound tourism, Fig. 10.4 shows a gradual growth of the number of departures from 2016 to 2019. The interest in traveling and visiting other destinations increased among Kazakhstan people. As a result, many tourism intermediary companies grow, as well as the improvement in provided services can be observed. Another interesting observations made by Ziyadin et al. (2019) is that the main proportion of tourism is the outbound tourism, where the Commonwealth of Independent States (CIS) countries, both in terms of entry and outbound tourism, occupy a leading position of 91% in 2016.

The range of services offered by local tour operators kept on increasing from year to year. For example, the number of tourist accommodation has reached 18,583 in 2019, with annual growth of 4% in relation to 2018 (UNWTO, 2020). We can also observe a significant positive trend in the food and beverage serving activities, where quantitative growth is observed during the last 5 years (Fig. 10.5).

However, despite the increasing tendency of tourism development indicators in Kazakhstan, the share of tourism in the national total GDP is only nearly 1.6%. Kazakhstan is in 80th place in the Travel and Tourism Competitiveness Index overall ranking among 140 countries, according to the World Tourism Organization (UNWTO, 2019), Tourism is not yet at the level of its development adequate to maximize its potential. Natural resources, rich cultural and historical heritage are not sufficient for tourism development. Other challenges in the country mentioned above such as the lack of marketing strategies, the

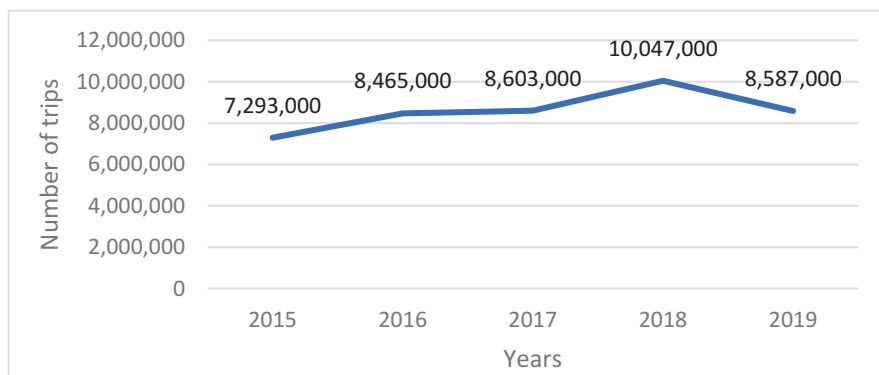


Fig. 10.3 Domestic tourism trips from 2015 to 2019 (Source: UNWTO, 2020)

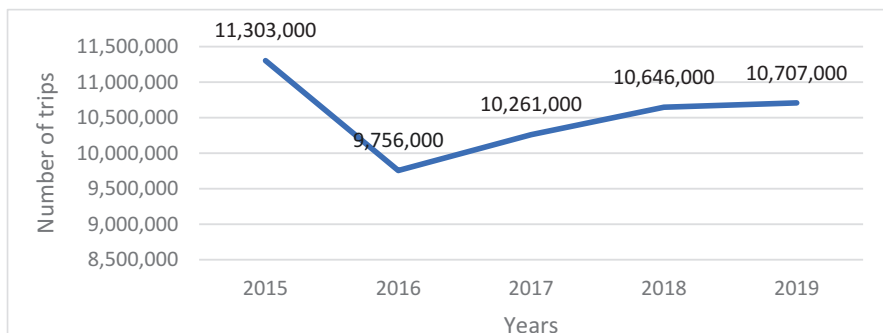


Fig. 10.4 Departures from 2015 to 2019 (Source: UNWTO, 2020)

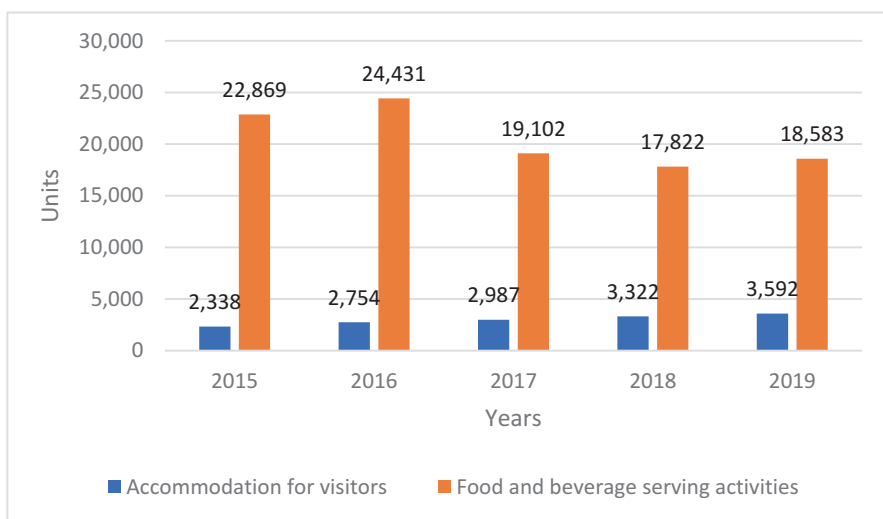


Fig. 10.5 Number of tourism establishments (Source: UNWTO, 2020)

infrastructure quality, weak skills of professionals in the tourism and hospitality, environmental issues result in difficulties affecting the tourism sector development (Abubakirova et al., 2016; Ramazanova et al., 2019a; Syzdykbayeva et al., 2015). According to Kazakh Tourism (2019), the main challenges in tourism development are the accessibility of information, poor marketing, prices for tourism products and services, as well the quality of infrastructure. With the fast-growing tendency in digital technologies in tourism and hospitality businesses, a special attention should be paid to the analysis of the situation in the area under study with the intention to increase tourism demand (Watkins et al., 2018).

ICT in Tourism in Kazakhstan

In the world ranking of the development of information and communication technologies in 2017 (ITU, 2021), Kazakhstan is in 52nd place out of 176 countries, without changing its position since 2015. Despite the country being in the CIS region, among the three leaders, ranking 3rd after Belarus (32nd place) and Russia (45th place), they are still improvements are needed to increase the position of the country.

The issue of the need to create a tourism industry in Kazakhstan was raised a long time ago. However, unlike the highly developed countries of the West, tourism in Kazakhstan, as well as in Russia and other CIS countries, is still not perceived as a fully-fledged branch of the sector of serving social and cultural needs and this is currently the subject of scientific analysis. In general, the concept of «tourism» is still associated with sports and health, and not with the economy that generates significant revenue.

The State program for the development of the tourism industry for 2019–2025 is concerned with the importance of digitalization in the tourist services market. As a result of the implementation of the Program and other strategic directions, it is expected and believed that the country will rise in the ranking to 30th place by 2022, 25th place by 2025 and 15th place by 2050 (Ziyadin et al., 2019).

The National Company “Kazakh Tourism” also recognizes the need for the introduction and diversification of ICT tools in the Kazakh tourism market. One of the key projects of the national company is the national tourism portal (Kazakhstan.travel), where foreign tourists can get acquainted with the peculiarities and sights of the country, get the maximum information for traveling in Kazakhstan. The portal also has a section for business that allows tour operators, travel agencies, artisans and souvenir shops to post information about their routes, goods and services free of charge (Kazakh Tourism, 2019; Ziyadin et al., 2019).

“Kazakh Tourism” National Company was established in 2017 following numerous successful events held in the country to continue the promotion of Kazakhstan globally as a travel destination. “Kazakh Tourism”, being the country’s brand manager for tourism and a subsidiary of the Ministry of Culture and Sports, ensures comprehensive and holistic positioning of the country both internationally and domestically. Kazakh Tourism places its focus on marketing and promotion of the country, attracting investments into tourism, and implementing the National Tourism Development Strategy until 2025.

The information in Kazakh, Russian, English languages can be consulted on the website of the company (<https://kazakhstan.travel/>). This website presents four facets of Kazakhstan’s tourism – the 4 E’s: Eco, Ethnic, Entertainment and Events. There is information about touristic paths in Kazakhstan. Main journey locations are Nur-Sultan, Almaty, Shymkent and space tourism in Baikonur.

Analyzing the ICT use in tourism in the context of the attractive country regions, the cities, where the level of well-being and IT-enlightenment of the population and number of internet users is higher are Almaty and Nur-Sultan. Almaty is one of the

main commercial and cultural cities in the South of Kazakhstan. In 2017, the (<https://visitalmaty.kz/>) website was launched, and its accounts were opened on social networks, where travelers can get useful information about Almaty and its attractions. Almaty (which means Apple City) is Kazakhstan's first capital. This city is very modern and has its unique flavor, possibly that of apples. Almaty is a god-send for those travelers who prefer outdoor recreation.

The capital of the country, located in the North of Kazakhstan is Nur-Sultan (Astana). It is in the heart of the Eurasian continent, equally accessible and open to all directions of the world. The city attracts guests from all over the world with its unusual appearance and unique architectural design, as well as with its cultural and business events on a global level. It was here that the exhibition EXPO-2017 was organized and brought Kazakhstan even greater international fame and recognition.

ACT Kazakhstan (Analysis & Consulting Team) established in 2008 is one of the largest and fastest-growing inbound tour operator companies in the Republic of Kazakhstan. It has two offices in Almaty and Nur-Sultan, and provides the widest range of tourist products and services in more than 20 cities and 5 resorts in Kazakhstan.

Activity is conducted in five main directions and is represented by the following brands:

- Almaty City Tour – programs and excursions in Almaty and Almaty region, tours in Kazakhstan and Central Asia;
- Astana City Tour – programs and excursions in Nur-Sultan and Akmola region, tours in Kazakhstan and Central Asia;
- ACT Adventure – active tours, adventures and expeditions in Kazakhstan;
- ACT MICE – organization of business trips and events in Kazakhstan;
- ACT Training – conducting of training and seminars in the field of service and hospitality (ACT, 2021).

In May 2017, the Kokshetau Tourist Information Center “VisitAqmola” was established following the Action Plan for the development of the tourism industry of the Akmola region for 2017–2019. Akmola region is one of the main tourist region located in the North of Kazakhstan, containing national natural parks, such as “Kokshetau”, “Buiratau” and “Burabay”. The region has a unique natural potential as Burabay, Zerenda and Korgalzhyn among others and interest in exploring their tourism potential is growing (Mussina et al., 2019; Ramazanova et al., 2019b; Yegemberdiyeva et al., 2020).

The main goals of “VisitAqmola” are the formation and dissemination of information about the unique tourism potential of the region, as well as promotion, support of new business entities and their further information support in the field of tourism activities. VisitAqmola has developed a new Internet resource about the tourism potential of the Akmola region (<https://www.visitaqmola.kz/en/>) in three languages. The Internet resource takes into account new trends in web design with the use of wide-format video, non-standard content presentation and maximum convenience of using the resource by tourists. In this direction, a mobile application for

Table 10.1 Main touristic websites in Kazakhstan

Main touristic websites	Main websites for tickets
https://kazakhstan.travel/ https://qaztourism.kz/ru https://city-tour.kz/index.php https://someplace.kz/ru https://kazkurort.kz/ https://tengritravel.kz/ https://www.tripadvisor.ru	Tickets.kz Chocotravel.com Santufei.com Aviata.kz Aviablet.kz Biletix.kz

Source: Elaboration of authors (2021)

gadgets is being developed with the ability to read QR codes from tourist sites (on the iOS and android operating systems) with synchronization of the portal interface.

Main tourist websites used in the country are presented in Table 10.1. The mentioned websites provide information about the travel, transfer, accommodation, meals, as well as health procedures and various excursion programs, maps, routes in the country. Some websites collect up-to-date information about interesting places and routes for traveling in Europe and other continents.

Widespread use of modern information technologies and an increase in the number of Internet users had a significant impact on the development of e-commerce. The population of Kazakhstan has become increasingly active in making purchases using various online Services.

As for the services for booking travel services, there are already a lot of them in the Kazakhstan market: Tickets.kz, Chocotravel.com, Santufei.com, Aviata.kz, Aviablet.kz, Biletix.kz among others.

Empirical Approach and Data Specification

This study has conducted the correlation of information technology with tourism demand in Kazakhstan. The research approach is started with a discussion of the gravity equation. The gravity model is extensively applied for estimating international trade flows between two countries (Anderson & van Wincoop, 2003) international tourism flows (Khadaroo & Seetanah, 2008; Okafor et al., 2018; Waqas-Awan et al., 2020) or immigration flows (Balli et al., 2016; Karemera et al., 2000; Lewer & Van den Berg, 2008; Santana-Gallego & Paniagua, 2020).

In recent years the gravity model has become a very popular approach in the tourism literature with consistent outputs and high goodness of fit (Karemera et al., 2000; Lorde et al., 2015; Santana-Gallego & Paniagua, 2020; Xu et al., 2019). Moreover, the Gravity model explains the bilateral tourism flows between two countries are directly interacted to the countries' economic size and inversely

proportional to the distance between them. The simple gravity model for tourism flows between two countries i and j can be expressed as follows:

$$F_{ij} = G \frac{M_i^{\beta_1} M_j^{\beta_2}}{D_{ij}^{\beta_3}} \quad (10.1)$$

Where, F_{ij} is the tourism flows between countries i and j ; M_{ij} is the economic mass between countries i and j , D_{ij} is the distance between countries i and j ; and G is a constant.

It is foremost to be noted that, information communication technology is crucially considered as a key factor in modelling tourism demand. Tourism demand can be identified for several or individual countries, states, regions and local areas. Regarding the type of visit, demand can be disaggregated relative to holiday or business as well by type of tourist such as nationality, education, age, gender (Lim, 1997).

International tourism demand can be formulated as follows:

$$TA_{jt} = f(T_{It}, K_{It}, O_{It}, D_{Jt}) \quad (10.2)$$

Where, TA_{It} is the number of tourist arrivals from the country of origin I to country of destination J (e.g., Kazakhstan) at time t ; T_{It} is a costs of transport, which denotes the costs of traveling from country of origin to destination; K_{It} is a variable denotes that, income per capita in the country of origin at period t ; O_{It} and D_{Jt} are qualitative factors related to the country of origin and destination, respectively. Additionally, multiplicative function (f) implies the inclusion of the natural logarithms of the original variables.

The simple gravity equation forms simply by transforming multiplicative forms of Eq. (10.2) and expressed as

$$TA_{It} = \beta_0 + \beta_1 \ln Dist_{IJ} + \beta_2 \ln GDPpc_{It} + \beta_3 O_{It} + \beta_4 D_{Jt} \quad (10.3)$$

Deardorff (1998) and Santeramo & Morelli (2016) highlight that Eq. (10.3) can be amplified by the set of explanatory variables in logarithm form as a result we can obtain an augmented version of gravity Eq. (10.4) as

$$\begin{aligned} \ln TA_{It} = & \beta_0 + \beta_1 \ln DISTANCE_{IJ} + \beta_2 \ln GDPpc_{It} + \beta_3 \ln GDPpc_{Jt} \\ & + \beta_4 RPRICE_{It} + \beta_5 BORDER_{IJ} + \beta_6 COLONY_{IJ} + \beta_7 Net_{Jt} \\ & + \beta_8 Net_{It} + \lambda_{IJ} + \delta_t + \mu_{It} \end{aligned} \quad (10.4)$$

Where \ln shows natural logarithms; I and J are country of origin and destination sub-indexes. t is the period (2000–2018); β_0 is an intercept, $(\beta_1, \dots, \beta_8)$ are parameters to be estimated; μ_{It} is a well-behaved disturbance term. λ_{IJ} and δ_t are country-pair and year fixed effects used to capture bilateral countries characteristics over time such as gross domestic product per capita and relative price.

Data

According to the aim of this study, we define the dependent and independent variables. As a dependent variable, the international tourist arrivals (TA_{it}) to Kazakhstan from 122 countries from 2000 to 2018 is used. The inbound tourism dataset is obtained from the World Tourism Organization statistics library (UNWTO, 2019). Real gross domestic product per capita for the country of origin ($LnGDPpc_{it}$) and destination ($LnGDPpc_{jt}$) is used as a proxy of personal income and national wealth (Crouch, 1995; Lim, 1997), and obtained from the World Bank Development Indicators (World Bank, 2021). Distance is measured in kilometers between capital cities of origin and destination and used as a proxy for travel costs (Eilat & Einav, 2004; Fourie & Santana-Gallego (2013)). The relative price ($Rprice_{it}$) shows the price ratio of goods and services in Kazakhstan relative to origin countries. The relative price is measured based on the consumer price index (CPI) of Kazakhstan in terms of origin countries adjusted by the bilateral exchange rate (Morley, 1994). The data for the consumer price index and the exchange rate is taken from World Bank Development Indicators of the World Bank. The variable of interest, the number of internet users in origin (Net_{it}) and Kazakhstan (Net_{jt}) are used as a proxy of information technology development to support tourism in the country and taken from the Information and communication technology database (ITU). It enables easier communication, connecting a tourist to a travel agency, being aware of sight-seeing in the destinations; booking preferred flights, Cruise, Hotels (Barman & Nath, 2019; Naude & Saayman, 2005; Ramos & Rodrigues, 2013b). Regarding the control variable, having a common border ($Border_{it}$) and sharing a colonial ($Colony_{it}$) relationship are assigned as dummy variables which if take 1 if the country of origin and Kazakhstan have a common border or share a common colonial relationship between them, zero otherwise. These variables are used to capture the purpose of a tourist traveling to a destination (Demir & Gozgor, 2019; Khalid et al., 2020). These variables are obtained from Research and Expertise on the World economy database (CEPII).

Table 10.2 reports the statistical summary of each variable. The number of observations (Obs) indicates the number of observations in the sample population. Mean

Table 10.2 Descriptive summary of the variables

Variable	Obs	Mean	Std.Dev.	Min	Max
$\ln TA_{it}$	2310	5.991	3.036	0	15.286
$\ln GDPpc_{it}$	2297	8.718	1.572	4.718	12.152
$\ln GDPpc_{jt}$	2318	8.637	0.794	5.633	9.539
$\ln Rprice_{it}$	2216	2.066	2.719	-4.813	7.268
$\ln Distance_{it}$	2318	8.542	0.686	5.273	9.743
$Border_{it}$	2318	0.041	0.198	0	1
Net_{it}	2317	32.589	31.195	0.67	78.9
Net_{jt}	2230	37.096	30.412	0	99.65

Source: Stata 16 output

shows the average value of each variable used. Std.Dev. represents the estimated standard value. Min and Max describe minimum and maximum value of each variable used in this study.

The gravity equation is estimated using three estimators such as pooled ordinary least squared model (POLS) (Saha & Yap, 2014; Rosselló et al., 2017; Waqas-Awan et al., 2020), fixed effects (FE) (Fourie et al., 2020; Martins et al., 2017; Poprawe, 2015) and random effects (RE) (Ibragimov et al., 2021; Saha & Yap, 2014; Xu et al., 2019).

Results and Discussion

The result of gravity Eq. 10.4 represents in Table 10.4. The poolability test rejects the use of pooled ordinary least squared (POLS) estimator, and Random effects (RE) is found to be the most applicable estimator based on the Hausman tests (Table 10.3). Additionally, the POLS and FE estimators are estimated for comparison aim.

The obtained results justify that all expected sign of variables supports the economic theory and gravity model concept. Economic size of origin ($\ln GDP_{pc_i}$) and destination ($\ln GDP_{pc_j}$) are statistically significant and have a strong positive effect on tourism flows in Kazakhstan. Suggesting that, a 1% surge in income in the origin countries increases the number of international tourist arrivals to Kazakhstan by 0.4%. Similarly, an increase in the economic outputs of Kazakhstan tends to encourage the volume of tourism in this country. The relative price ($\ln Rprice_{it}$) is not statistically significant. Transport costs ($\ln Distance_{it}$) is statistically significant and has a strong negative impact on tourist arrivals to Kazakhstan by 2%. Neighboring countries of Kazakhstan are considered to be the main tourist generating region, which has a strong positive effect on the tourism demand of Kazakhstan. The variable of interest, the number of internet users (Net_{it}) is statistically significant and has a negative impact on tourist flows in Kazakhstan. Implying that the development of the level of information communication technology cannot progress tourism of Kazakhstan in the short term. Since it is a gradual process in which society should

Table 10.3 Model selection diagnostic tests

<i>Poolability test</i>	
Statistic	Result
F(7, 117) = 63.03 Prob > F = 0.0000	Reject H_0
H_0 : All of the fixed effects are zero; H_a : Reject H_0 .	
<i>Hausman test</i>	
Statistic	Result
chi2(5) = 7.36 Prob > chi2 = 0.1951	Accept H_0 , in favor of RE
H_0 : All the fixed effects are zero; H_a : Reject H_0 .	

Source: Stata 16 output (2021)

Table 10.4 ICT on tourism development in Kazakhstan

	(1)	(2)	(3)
	POLS	RE	FE
$\ln\text{GDPpc}_{it}$	0.243 (0.201)	0.455*** (0.109)	0.412** (0.159)
$\ln\text{GDPpc}_{jt}$	0.015 (0.214)	0.325** (0.159)	0.803*** (0.150)
$\ln\text{Rprice}_{it}$	0.069 (0.075)	0.104 (0.065)	0.088 (0.134)
$\ln\text{Distance}_{ij}$	-1.999*** (0.327)	-2.022*** (0.327)	
Border_{ij}	4.684*** (0.935)	4.466*** (0.990)	
Net_{jt}	-0.001 (0.006)	-0.016*** (0.002)	-0.016*** (0.002)
Net_{it}	0.032*** (0.010)	0.009*** (0.002)	0.008*** (0.002)
Constant	19.293*** (2.716)	15.777*** (2.348)	-4.340** (1.788)
Observations	2139	2139	2139
R-squared	0.553	0.550	0.398
Country-pair effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Hausman test		7.36 (0.1951)	

Source: Stata 16 output (2021)

Standard errors are in parenthesis

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

be involved and acknowledge the use of ICT in an emerging country of Kazakhstan. On the other hand, an increase in the number of internet users of origin countries (Net_{it}) considerably increases the tourism flows in Kazakhstan.

Conclusion

This study examines the effect of ICT on international tourist arrivals to Kazakhstan from 122 countries of origin from 2000 to 2018 using the gravity model. The results reveal that the infrastructure of communication and technology is gradually progressing in emerging country of Kazakhstan which cause a neutral effect on tourism development in the short term. On the other hand, in the long term, it is highly expected that the new level of communication and technology in Kazakhstan could significantly boost tourism development.

Moreover, the present study findings revealed a positive relationship between income in the origin countries and the number of international tourist arrivals to Kazakhstan. Thus, from the marketing perspective, a special focus should be on the international markets with growing economic situations. On the other side, according to the results, one of the interesting and important markets should be considered neighboring countries of Kazakhstan, since there exists a strong positive effect on tourism demand of Kazakhstan.

The country has already recognized the tourism sector as a potential economic driver and effective tool for moving from a natural resources dependent economy to a more diversified one and started to take steps towards supporting tourism activities. State national program has been elaborated with several regional tourism development strategies concerning the improvement of the tourism market and its competitiveness. Nevertheless, the results urge country policymakers and tourism stakeholders to take quick more practical actions subject to ICT development and considering the demand of potential visitors. The results highly emphasize that the role of ICT is not extensively applied to the tourism sector of Kazakhstan. As indicated by previous researchers a number of the tourism sector is still facing many challenges related to tourism infrastructure, quality of products and services, low competencies of tourism staff, weak marketing strategies and low ICT application in services. Thus it is highly recommended to invest in ICT to promote tourism products and services which lead to a reduction in the price of goods and services, consequently increase the interest of visitors and the number of tourist arrivals. From the marketing point of view, it recommended reducing the transport costs for international tourists traveling from long-haul countries.

The creation of a modern competitive tourism market in Kazakhstan as a promising tourist destination is able to make a significant contribution to the development and diversification of the country's economy, as well as contribute to the conservation and effective use of cultural and natural heritage.

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