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The Role of ICT Indices in Tourism Demand of Iran
(The FMOLS Co-integrating Approach)

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Abstract
Information and Communication Technology (ICT) is one of the main determinants of E-commerce industry such as tourism sector in developing countries like Iran. For this reason, the main purpose of this paper was to investigate the short-run and long-run relationships between ICT indices such as internet users, government expenditures on ICT to the GDP and mobile cellular subscription in Iranian economy during the period 1994 to 2015. The empirical model was estimated by applying Fully Modified Ordinary Least Square (FMOLS) co-integrating method as a sophisticated econometric methodology. The results of the empirical model indicated that there was a long-run relationship between ICT indices and tourism demand indicators like the number of tourist arrival in Iran. Moreover, the other explanatory variables such as living cost, real exchange rate and behavioral habit had negative and positive effects on the tourism demand respectively. The investment of government in ICT indices such as improving the share of ICT expenditures in GDP and enhancing the ICT quality are the important policy implications of this study. to the economic policy makers

1. Introduction

Tourism industry, as one of the most important industries in the world, plays a major role in improving the economic growth, job creation and sustainable development of countries and has been considered by experts, managers and economic planners of different countries. Statistical studies show that the economic impact of this industry is significant enough to account for 9% of global GDP. In the new age, Information and Communication Technology (ICT) has been considered with regard to performance enhancement, speed of operation and cost reduction in various areas. One of these sectors is the tourism industry.

This sector includes about 35% of world trade in the services sector and constitutes about 5-10% of GDP in different groups of countries. Therefore, tourism is one of the core bases of an economy and many countries attempt to improve their economic situation by focusing on tourism as a potential source of

economic enhancement. One of the main branches of the tourism industry is E-tourism which is associated with ICT indices.

The role of ICT in companies includes its utilization for management goals, both internally and externally. ICT may help economic sectors improve their competitive status by speeding up their internal processes and information exchange. It helps in reducing the economic costs and increasing the quality of processes. However, to benefit from ICT, the relative advantage of ICT has to match an organization's needs, values and objectives.

ICT has enabled new distribution channels, thus causing a new business environment. Its tools have simplified business dealing in the industry through networking with other trading partners, distribution of product services and providing information to consumers across the sphere. On the other hand, consumers usually obtain the essential information to plan their journey and travels online; thus making information the key specification in the tourism sector.

In addition, tourism needs ICT to carry out many strategies such as fulfilling the integration of various sectors like the technical infrastructure, human infrastructure which contains skilled labor, vision and management, subsides for internet service providers, designing an integrated framework for online advertisement or official endorsement for online marketing, maintenance and updating websites, and establishing electronic linkages between all related sectors. Thus, the study of relations between tourism sector and ICT is momentous in the tourism literature.

Despite the presence of privileged tourism potential in Iran, due to lack of proper marketing and advertising environment, ICT still has limited noticeable share in the tourism sector. Whereas, developing countries such as Malaysia and the United Arab Emirates with investment on e-tourism, have created many opportunities for their country. Therefore, to change the current situation and improve its strategic position in the context of tourism, ICT has been used. In this regard, some effective measures have been taken in the field of ICT, especially on the Internet for giving information and advertising about its tourist attractions and facilities and welfare services. However, these activities still lack the necessary unity and integrity for the field of electronic tourism to find the growing needs and requirements. As such, improving the situation needs some fundamental changes in policies, programs and actions.

Mihajlovic (2012), Karimidizboni and Riganti (2007), and Buhalis and Deimezi (2003) indicated that there is a positive correlation between tourism demand and e-tourism. Moreover, by reviewing its theoretical base, it can be stated that ICT potentially reduces the transaction and operational costs in the destination country.

The previous empirical studies in developing countries like Iran revealed that the relationship between ICT indices and international tourism has not yet been considered empirically. Hence, to fill this gap, this paper aims to identify the long-run relationship between ICT indices and tourism demand in Iran over

the period of 1994 to 2015. To achieve this objective, the empirical model has been specified on the base of theoretical framework and estimated by Fully Modified Ordinary Least Square (FMOLS) as a co-integrating technique.

The rest of this article has been arranged as follows: The literature review is presented in section 2, followed by the model explanation and data sources in section 3. In section 4, the empirical findings are analyzed and the final section is dedicated to concluding remarks and policy implications.

2. Literature Review

The use of information technology by the tourism industry began in the early 1970s (Collins and Cobanoylu, 2008) and since then ICT has become the most impressive tool in tourism and hospitality marketing. Nowadays, ICTs pervades all aspects of the tourism industry and plays a critical role in tourism organizations and destinations competitiveness as well as the entire industry as a whole. According to Gratzer et al. (2007), using ICT in the tourism industry is one of the most convenient ways of changing this sector. Doulien et al. (2002) stated that one of the most efficient tools in cultivating and distributing tourism is the Internet, and Stipanu (1993) believed that technology has strongly improved tourism performances.

The use of ICT in tourism can be divided into three areas, viz; internal networks (Internet), external networks (Extranet) and the Internet. The application of ICT in the internal networks of the tourism sector increases efficiency and effectiveness and is applied in different parts of the company. On the other hand, the use of ICT in local and Internet networks has led to a powerful correlation between the various activities of acting tourism units; also, the use of ICT tools in the resource management system of the global distribution, the Destination Management (DMS) in the aviation industry, and in hotels and travel services is palmate. The ICT tool has led to a trend change in tourism along with creation of new strategic and managerial mechanisms in this sector. One of the most important uses of ICT in corporations has been strengthening of horizontal and vertical integration and increment of economies to scale in small and medium-sized enterprises (SMEs).

Electronic tourism (e-tourism) is the application of new technologies in two dimensions of tourism: supply and demand, in which the services needed by tourists, the fields of marketing and tourism purposes are provided. Hence, tourists utilize information and communication technologies to ascertain tourism objectives and their situation in demand side, and in the framework of their motives. Meanwhile, by using the Internet in the field of tourism specialized plans and in the framework of recognizing vacation time, along with responding to the needs of tourists, travel agencies have been marketing tourism for various purposes. One of the main changes from e-tourism in view of tourism supply includes the formation of DMO's. These organizations provide tourists with a diversity of electronic services in the context of tourism, allowing them to search and plan a trip. The duties of these organizations include management of

tourism resources, planning for tourism activities, promotion and marketing, training of staff and the provision of services for tourists. According to the nature of tourism, the utilization of information and communication technology can be useful in improving the efficiency of delivery of services and transactions, as well as predicting the opportunity to gain a wide and diverse range of experiences in various fields of tourism. In the global field, ICT development has had a large impact on tourism and travel organizations, and is still changing the structure and processes. Thus, the main objective of e-tourism is to provide appropriate opportunities such as welfare, travel security and cost reduction for foreign tourists. In this regard, some of the main benefits or advantages of electronic tourism include:

- It provides high quality internet services for tourists.
- It improves the relations of organizations with the tourism sector.
- It manages controls and guides tourists.
- It saves time and costs for tourists.
- It prepares the best and suitable educational channels for tourists.
- It solves the possible problems of the tourism sector and directs relationship with tourists.

In the context of empirical studies, Albrecht and Zemke (1985) stated that e-compliance is another advantage of ICT in tourism demand. It gives rise to customer loyalty and ensures that customers are more satisfied. Moharrer (2002) investigated the relations between ICT and the tourism sector in Pakistan during 1990-2000. The results indicated that the expansion of the worldwide web and ICT indices have positive and significant impacts on the tourists attraction to the country of Pakistan. Jeong et al. (2003) reported a large increase in the number of customers who make reservations directly from hotel websites and this influences customer satisfaction. In another study, Mills and Law (2004) asserted that the Internet has changed tourist behavior dramatically. Law and Jogaratnam (2005) further concluded that ICT is capable of transforming the tourism nature and hospitality products, business and competition. The results of their study showed that ICT can change the structure of the tourism industry and affect business and competition in the tourism sector. Buhalis and Law (2008) presented a comprehensive review on the relationship between ICT and tourism and analyzed previous studies in this context. They identified three main themes which include: Customers and demand dimensions, technological innovation and industry functions .

It has been noticed that the effect of ICT on customer behavior is one of the main fields; also, researchers have stated that the Internet is one of the most effective technologies that have changed travelers' behavior. Maria and Vasilis (2009) investigated the growth of the e-tourism sector in the case of Mediterranean countries and showed that the increase of the e-tourism sector depended on the increase in tourism demand and internet influence. Ekanayake and Long (2012) investigated the relations between tourism development and

economic growth in developing countries by using Granger causality tests in a multivariate model and the annual time series data during 1995–2009. The results of their study suggested that governments of developing countries should focus on economic policies to promote tourism as a potential source of economic growth.

Ramos and Rodrigues (2013) explored the importance of ICT for tourism demand in developing countries during 1975 to 2010, and concluded from their empirical findings that internet users and the ratio of government expenditures in ICT to GDP as proxies for ICT had positive and significant effects on the tourism demand in these countries. Bethapudi (2016) investigated the effect of ICT on the tourism industry in India during 2014. For this, a sample of 112 managers of tourism, travel and hospitality enterprises in India have been selected. The empirical findings showed that all the ICT indices have positive and significant impacts on tourist arrival to India. Rajamohamed (2016), by applying inferential statistics method and a sample of 138 travel firms, concluded that ICT has a positive and significant effect on tourism in Thailand. Wahab (2017) studied the impact of ICT on tourism demand in India during the period 1975-2013 and concluded that whereas IT helped in reducing the cost incurred in the dissemination of knowledge, it also decreased the inefficiencies related to the spread of information. Thirdly, IT has assisted in the reduction of barriers affected by distance and time. By employing ICT usage patterns, Zaidan (2017) analyzed the impact of ICT on small and medium enterprises of Middle Eastern countries, engaged in tourism, during 2015. The results of this study showed that the accessibility of SMEs to the internet and other communication tools has positive influence on the tourism demand in these countries. Bekteshi and Bekteshi (2017) investigated the influence of ICT indices on the level of the tourism sector in Albania during 2015 and indicated from the empirical evidence that with increase in ICT quality and structure improvement, the tourism demand in this country will increase .

In the case of Iran, it can be argued that none of the studies have explored the short and long-run nexus between ICT and tourism. However, in closer and similar studies Sanayiand (2012) attempted to survey and introduce the most important effects of ICT on the 4Ps (price, place, production and promotion) as the basis of marketing mix and concluded that it is possible to create a better way to utilize the internet and electronic marketing in tourism through ICT. Mamaghani (2009) claimed that travel agencies which successfully use internet as a distribution channel has an easier access to global market, and also have to adapt their websites and online booking for overall experiences and expectations of tourists. In addition, future travel agencies will have to keep up with competing destinations that offer user-friendly activities, values and convenience. By reviewing the empirical studies on the relationship between ICT and Iranian tourism demand, it is revealed that none of the previous studies have examined the relationship between these two variables. Hence, the major contribution of this paper is to estimate the long-run relations between ICT

indices and tourist arrivals as a representative for tourism demand in Iran by applying FMOLS approach.

By employing the time varying approach (TVP), Mohammadzadeh et al. (2010) analyzed the international tourism demand for Iran using data from 1971-2006. They found that world income, taste and habit have positive effects while the cost of living in the country of origin has a negative and significant effect on the international tourism of Iran. In another study, Mohammadzadeh et al. (2010) estimated the tourism demand function for Iran by using TVP while selecting India, Turkey and Pakistan as the origin countries for traveling to Iran. The empirical results indicated that income and habit have positive impacts whereas the cost of living has a negative impact on the international tourism of Iran. Moreover, the number of medical tourists who want to travel to Iran from Turkey is more than those of Pakistan and India.

In another study, Taghvaei et al. (2013) investigated the effects of ICT on tourism planning in Shiraz city over the period of 1990-2011 and indicated that accessibility to ICT tools has a positive and significant influence on tourist's satisfaction .

Hashemi et al. (2014), by analyzing the main determinants of tourism planning in Iran, concluded that management weakness and shortage of information regarding e-tourism are the main obstacles to tourism development in Iran.

Also, through inferential statistics, Safaeepour et al. (2015) analyzed the influence of ICT on the tourist arrivals in Shiraz city during 2014 and showed that the correlation between ICT indices and E-tourism is 0.85. Moreover, the use of ICT indices in tourism affairs is not noticeable .

By surveying the important empirical studies on the relationship between ICT and international tourism in Iran, it was revealed that none of the previous researches have examined the relations between these two variables. Hence, the main contribution of this paper is to estimate the short-term and long-run relations among ICT indices and tourism demand in Iran by applying the Toda-Yamamoto and FMOLS approaches.

3. Model Specification and Data Sources

In the present study, an adjusted method of the short-term Granger causality test suggested by Toda and Yamamoto (1995) and the Fully Modified Least Square was used for investigating the short and long-run relations among ICT indices and international tourism for the Iranian economy. Toda and Yamamoto's (1995) methodology is based on the augmented vector of the auto regressive model and a Wald test statistic that asymptotically has a chi square distribution. In this approach, the augmented (k+dmax) is the order of the estimated VAR model, where k is the optimal lag length of the system that can be chosen by applying information criteria such as AIC and SC with respect to the sample size and its characteristics; dmax is the maximum order of stationary variables. One of the distinctive and important features of Toda and Yamamoto's

causality test is that it can be applied when there are no co-integration relations among variables and does not require any information and knowledge of the stationary situations and properties of the equations (Akcay, 2014). The Toda-Yamamoto model can be defined as following bi-variate VAR equations:

$$\begin{bmatrix} x_{1t} \\ x_{2t} \end{bmatrix} = \begin{bmatrix} \alpha_{10} \\ \alpha_{20} \end{bmatrix} + \begin{bmatrix} \alpha_{11}^{(1)} & \alpha_{12}^{(1)} \\ \alpha_{21}^{(1)} & \alpha_{22}^{(1)} \end{bmatrix} \begin{bmatrix} x_{1,t-1} \\ x_{2,t-1} \end{bmatrix} + \begin{bmatrix} \alpha_{11}^{(2)} & \alpha_{12}^{(2)} \\ \alpha_{21}^{(2)} & \alpha_{22}^{(2)} \end{bmatrix} \begin{bmatrix} x_{1,t-2} \\ x_{2,t-2} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} \qquad (1)$$

In the above formula, x1t and x2t are the international tourism and ICT indices (internet users, mobile cellular line and ratio of government expenditures in ICT to total government expenditures), respectively. After investigating the short-run causality test between ICT and international tourism, the FMOLS approach was used for estimating the long-run relationship between ICT indicators and the number of tourist arrivals. The FMOLS co-integration approach originated by Phillips and Hansen (1990), provides optimal estimates of co-integrating equations and adjusts least squares to define the serial correlation effects and for endogeneity in the regressors that appear from the existence of co-integrating relations. The FMOLS estimator utilizes initial estimates of the symmetric and one-sided long-run covariance matrices of error terms. For illustrating the FMOLS method, consider a multivariate regression model:

$$y_t = \beta_\cdot + \beta_\backslash' x_t + u_t \qquad (2)$$

In the above equation, y_t represents the dependent variable while x_t is the $(K \times 1)$ vector of covariates. Moreover, assume $\Delta x_t = \mu + w_t$; where μ is a $(K \times 1)$ vector of drift parameters and w_t is a $(K \times 1)$ vector of stationary variables. With definition of the consistent estimation of u_t and w_t as $\hat{\xi}_t = (\hat{u}_t, \hat{w}_t)'$, the long-run variance covariance of $\hat{\xi}_t (V)$ is $\hat{V} = \hat{\Gamma} + \hat{\Phi} + \hat{\Phi}'$. In this formula, $\hat{\Gamma} = \frac{\backslash}{T-\backslash} \sum_{T=\Upsilon}^{T} \hat{\xi}_t \hat{\xi}'_t$, $\hat{\Phi} = \sum_{s=\backslash}^{m} w(s,m)\hat{\Gamma}_s$; $\hat{\Gamma}_s = T^{-\backslash} \sum_{t=\backslash}^{t-s} \hat{\xi}_t \hat{\xi}_{t+s}$ and w(s,m) is the lag curtailment window.

With respect to the above formula, the FMOLS estimator has been defined as:

$$\hat{B}_{FMOLS} = (W'W)^{-\backslash}(W\hat{y}^*) - TD\hat{Z} \qquad (3)$$

Where, W $(t \times k)$ is a matrix of all covariates containing a constant, D represents the deterministic trend regressors, $\hat{y}^* = y_t - \hat{v}\hat{w}_t$ is adjusted dependent variable and $\hat{Z} = (x', D')$ is the vector of explanatory and deterministic trend variables.

If the error term gained through FMOLS proves stationary, then y and x

variables in Equation (2) are co-integrated. The stationary nature of the error term can be examined by any classical unit root tests such as Augmented Dickey Fuller and Philips-Perron.

In this paper, the dependent variable has been defined as the number of total tourist arrivals to the Iran (TOUR) and variables of ICT indicators such as internet users (IU), mobile cellular subscription (per 100 people) (MC) and ratio of government expenditures in ICT to GDP (ICTE); real exchange rate (RER) is computed as the product of nominal exchange rate in ratio of producer price index in USA and consumer price index in Iran. The CPI index and behavioral habit (first order lag of dependent variable) have been considered as explanatory variables.

The annual time series data sets for all the variables were collected from World Bank indicators (WDI) from 1994 to 2015[1].

4. Empirical Findings

To examine the stationary status of variables, the ADF and PP unit root tests were conducted and reported in Table 1. After this step, the results of short-term causality and long-run estimation of co-integrating vector are presented in Tables 2 and 3. The short-run causality test was conducted by the Toda-Yamamoto (1995) approach. In this method, the first step is to determine the order of stationary variables (dmax). For this purpose, it is necessary that classicical and first generation stationary tests such as the Augmented Dickey-Fuller and Philips-Perron be applied.

Table 1. The Results of ADF and PP stationary Tests

Variable	ADF Statistics		PP Statistics	
	Constant	Constant and Trend	Constant	Constant and Trend
TOUR	-0.34*	-1.23*	-0.28*	-1.35*
IU	-2.23**	-3.75**	-4.39**	-2.69**
MC	-0.17*	-0.95*	-0.15*	-0.92*
ICTE	-0.56*	-5.12**	2.25**	-3.89**
CPI	-3.45**	-3.56**	-1.93**	-1.94**
RER	-0.29*	-0.83*	-0.28*	-1.25*

Note: * and ** indicate that the variable is stationary in the first difference and levels I (1) and I (0), respectively.
Source: Author Computations

As seen in Table 1, the results of ADF and PP unit root tests revealed that TOUR, MC and RER are stationary with first difference or I(1) and other

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[1] Because to the limited access to the ICT indices for Iran, the period of this paper has been constrained to the 1994-2015.

explanatory variables (CPI and IU) are integrated in level I(0). The next step in Toda-Yamamoto causality test is to determine the optimal lag length (k), with respect to the size of the sample, using the SC Information Criteria. The results showed that the optimal lag length is k=1. After examining the stationary order of variables and finding the optimal lag by information criterion statistics, it was possible to conduct the Toda-Yamamoto causality test. The results of this test are reported in Table 2.

Table2. The Results of the Toda-Yamamoto (TY) Causality Test

From IU to TOUR		From MC to TOUR		From ICTE to TOUR	
χ^2 Statistics	Prob	χ^2 Statistics	Prob	χ^2 Statistics	Prob
4.86	0.03	5.28	0.024	9.23	0.001
From TOUR to IU		From TOUR to MC		From TOUR to ICTE	
χ^2 Statistics	Prob	χ^2 Statistics	Prob	χ^2 Statistics	Prob
0.35	0.82	2.36	0.21	3.69	0.17

Source: Author Computations

As can be seen from Table 2, the results of TY causality test indicated that there was unilateral causality from the internet users, mobile cellular subscription and share of ICT expenditures to the number of tourist arrivals at 5% significance level. Therefore, there was a unidirectional causality from all the indicators of ICT to tourist arrivals for Iran during 1994 to 2015. To estimate the long-run nexus among ICT indices and international tourism demand, the FMOLS approach was used as a convenient co-integrating method in small samples. The co-integrating equation was estimated by inclusion of 1 lags and leads in the estimated equation. The result of model estimation is reported in Table 3.

The results of model estimation showed that all ICT indices like IU, MC and ICTE in these situations had positive and significant impacts on tourist arrival as a proper proxy for tourism development. The first lag in tourist arrival as a representation for behavioral habit had positive and significant influence on the tourist arrival in the current year. Hence, the choice of destination country (Iran) in previous periods has led to increase in foreign tourist arrivals. Real exchange rate as a proxy for competitive degree index has a positive and significant impact on tourist arrival. In other words, with increase in real exchange rate, the real purchasing power of foreign tourists to choice and departure from Iran will increase. The CPI index as a proxy for living cost in the destination country has negative and significant effects on tourism demand. Thus, it can be argued that the increase of CPI in Iran has led to increase in departure cost to the destination country such as Iran and as a result to decrease in tourist arrival.

So, it is necessary to test the stability of estimated coefficients by Hansen test statistic whose results are displayed in Table 4.

Table 3. FMOLS Estimates of the Co-integrating Equation

ICT Indices	Explanatory Variables	Coefficient	t-Statistics	Prob
IU	C	2.36	1.69	0.09
	IU	0.56	4.61	0.000
	RER	0.74	7.23	0.000
	TOUR(-1)	0.53	3.95	0.000
	CPI	-0.31	-2.35	0.04
	, $\bar{R}^2 = 0.91$, Long-run Variance=0.46 $R^2 = 0.92$			
MC	C	1.78	1.35	0.18
	MC	1.04	5.86	0.000
	RER	0.23	3.34	0.002
	TOUR(-1)	0.36	6.25	0.000
	CPI	-0.23	-8.93	0.000
	, $R^2 = 0.82$, Long-run Variance=0.73 $R^2 = 0.83$			
ICTE	C	-6.89	-0.89	0.32
	ICTE	1.56	4.23	0.000
	RER	0.35	3.23	0.01
	TOUR(-1)	0.89	2.34	0.042
	CPI	-0.75	-3.93	0.000
	, $R^2 = 0.73$, Long-run Variance=0.89 $R^2 = 0.74$			

Source: Author Computations

Table 4. Hansen Parameter Instability Test

LC Statistics	Stochastic Trends	Prob
0.31	5	0.21

Source: Author Computations

The results of Hansen parameter instability showed that the null hypothesis (parameter stability) has been accepted and estimated coefficients were stable during 1976 to 2014. In the last step, the results of normality test for residuals are presented in Table 5.

Table 5. The Results of Residuals Normality Test

Jarque- Bera Statistics	Prob
2.85	0.32

Source: Author Computations

The results of normality test for the long-run residuals showed that the null hypothesis has not been rejected; at 5% significance level, the residuals followed the normal distribution in the long-run.

5. Concluding Remarks and Policy Implications

The present research primarily analyzed the short-term and long-run nexus among indicators of ICT and the number of tourist arrivals as a proxy for international tourism demand in the Iranian economy during 1994 to 2015. For

this purpose, the Toda-Yamamoto and FMOLS approaches were used for investigating and examining the short-term causality and long-run relationships among ICT indices and tourist arrivals. The empirical findings of TY causality test suggested the existence of a unidirectional causality from the mobile cellular and ICT expenditures to the international tourism demand; however, no causality from international tourism to any of the indicators of information and communication technology was found.

Moreover, the results of FMOLS approach indicated that in the long-run, all indicators of ICT such as internet users, mobile cellular subscription and ICT expenditures had positive effects, while a dummy variable had negative and significant effects on the international tourism of Iran over the period of study.

Similarly, real exchange rate and behavioral habit had positive and significant influences on tourist arrival in Iran. Hence, an increase in real exchange rate can lead to an improvement in the degree of competitiveness and decrease the living cost in the destination country, thereby contributing to the growth of the tourism sector. Therefore, the control of domestic price level can further inspire foreign tourists to choose Iran as the best option for travel. The results of this study are accompanied with the theoretical base and important empirical studies such as Akcay (2014), Smith and et al. (2011), Connell (2006) and Bethapudi (2016).

It is argued that promoting and raising the e-readiness of individuals and the society via policies that increase access to ICT tools and skills to use them is needed in the context of tourism. However, generally electronic tourism is still relatively a passive sense to tourists now engaging in cultural tourism. Currently, the use of ICT in the tourism sector is relatively low and is confined to receiving information on tourism .

Based on the main results of this research, it can be concluded that the development of the ICT sector has positive effects on international tourism demand. Therefore, the main policy implication of this study is that the economic policy makers should adopt appropriate policies for increasing ICT expenditures and attracting more international tourists. Hence, improving the ICT structures can provide development of the tourism sector in Iranian economy.

Moreover, the creation of data bank for the tourism sector can lead to increase in tourism revenue and as a result, improvement of economic growth. On the other hand, encouraging organizations to provide electronic services through ICT is the other policy implication recommended for tourism policy makers.

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