

THE RELATIONSHIP BETWEEN HEALTH CARE AND TOURISM DEMAND IN IRANIAN ECONOMY

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Abstract

The relationship between health care and international tourism is one of the important issues in tourism literature. The main objective of this study is to investigate the correlation between health care and international tourism in the long-run and short-run by using a fully modified ordinary least square (FMOLS) and Toda-Yamamoto approach over the time period of 1971-2016. The empirical results of this study indicate that there is a long-run relationship between health care and tourism. Health care has a positive and significant effect on the tourists' arrivals as a proxy for international tourism demand. Moreover in the short-run, the results suggest that there is unilateral causality from health care to international tourism. Hence, the main implication policy of the study is that policy makers should adopt policies to improving health care and attract more international tourists.

Keywords: Health Care, International Tourism, FMOLS, Toda and Yamamoto Approach

JEL classification: C22, I10

1. Introduction

International tourism is a major income source and a principal export for many low income countries as well as for developed ones. In recent years, many developing countries focus economic policies on the promotion of international tourism as a potential source of economic growth. Recently, the tourism industry has witnessed a prominent increase all over the world. For instance, the tourism receipts in 2012 reached 1075 billion US dollars vis-a-vis 2 billion US dollars in 1950, and international tourist arrivals increased to 1035 million in 2012 vis-a-vis 25 million in 1950 (UNWTO 2013).

One of the main branches of tourism industry is the health tourism. It has been an emerging industry in recent years and both developed and developing countries are involved in this field. The direction of international trade is opposite that of the traditional model. Consequently, countries that once primarily exported medical services to less developed countries are now purchasing health care from these same countries. So nowadays, health tourism destinations can be divided into two groups; one group is advanced countries in which patients seek to obtain better care unavailable at home, such as those residents that come from developing countries such as China and South East Asia, and another group is developing countries in which patients from developed countries prefer to receive less expensive treatment than that available in their home country. The major push factor for health tourism is the rising health needs of an ageing population which turn to be the major demand for medical care outside of developed nations. The major pull factors for medical tourism are cost-effectiveness and the availability of services on demand in combination with the unique features offered at a destination.

It has been estimated that the global medical-tourism industry currently generates annual revenues of up to US\$ 60 billion (negatively 40 billion), with 20% annual growth (Horowitz, Rosensweig, & Jones, 2007). The total number of medical tourists has also increased, from 19 million travelers in 2005 to 25.8 million in 2007, which is an annual growth rate of 16.5%. However, a new McKinsey study prepared by Ehrbeck, Guevara, and Mango (2008), suggests that the market is not as large as reported, and most medical travelers seek higher quality and faster service instead of lower costs. McKinsey places the current market at 60,000–85,000

inpatients per year, but these numbers could grow substantially if certain barriers, such as non-coverage from payers, were removed.

The relationship between international tourism and health care has been considered in theoretical framework and empirical studies such as Connell (2006), Page (2008) & Bies and Zacharia (2007). The review of empirical studies in developed and developing countries shows that in the Iranian economy, as a developing country, the relationship between two variables has not been considered empirically yet. Hence, the main aim of this study is to investigate the short-run and long-run relationship between health care and international tourism in Iran over the period of 1971-2016¹. To achieve this objective, the Toda and Yamamoto and Fully Modified Ordinary Least Square econometric methods have been used as appropriate techniques for causality and long run investigation.

For this purpose, the rest of paper is organized as follows: In section 2, the theoretical framework between health care and tourism has been investigated. In the next section, empirical studies on the relationship between tourism and health care have been reviewed. Afterwards, we introduce the model specification and data sources. In section 5, the empirical results of this study have been analyzed. The final section is concerned with concluding remarks and policy implications.

2. THEORETICAL BASE

There are two ways in which the health care can affect the tourism industry of a country. First, tourists may assess a potential destination based on its track record in providing a healthy environment to visitors. Hence, the occurrence of accidents, injuries and health related issues either personally experienced or publicized by the press can adversely affect the experience or perception of tourists, which in turn negatively impacts the tourism demand for a destination. Secondly, a number of governments have sought to develop medical tourism to further enhance their tourism industries, believing such efforts can increase both the number of tourists and tourist revenues. In this view, it is expected that development of health care lead to the increase of international tourists.

According to Page (2008), the relationship between health care and tourism can be discussed in three stages as follows:

- Pre travel, where the potential tourist decides on the destination and makes the arrangements to travel;
- The trip (travel phase).
- The post-travel phase.

During each of these stages, tourists may have interactions with medical services, services or sources of information. The widely argued premise among social psychologists is that the need for travel medicine is predicated on the assumption that tourists' behavior change when on holiday, compared to that in the origin area. Debates associated with the tourist experience on hedonism, behavior change and the cultural significance of holidays in shaping these changes remain contentious and complex to unravel. However, as many empirical studies of traveller behavior and the propensity to experience health problems confirms, many travellers engage in much more risky behavior, either consciously or sub-consciously.

Moreover, low cost is usually the primary motivation for healthcare tourists to travel to abroad, and in addition to receiving medical services, they can benefit from the leisure opportunities. Following to Yap (2007), people travel for four types of healthcare:

- Essential health care: where the care is not available in the home country, either because the country does not have that level of medical sophistication, or has yet to allow the particular procedure, or has long waiting lists due to resource constraints.
- Affordable health care: where the care is available but out of reach to the particular patient who simply cannot afford it. This could be because of high costs or insufficient insurance coverage.
- Quality of health care: where the care available locally is perceived to be of inferior quality to the healthcare available overseas.

¹ In Iranian economy, the data set for health statistics has been constrained to 2016.

- Premium health care: where traveling for healthcare is seen as a luxury and patients choose the healthcare of another country because it adds prestige and demonstrates that they can afford it or that they have the better sense to select it.

By review of theoretical framework, it can be concluded that health care is one the important issues in tourism literatures, and the relationship between health care and tourism should be considered in the empirical model.

3. EMPIRICAL STUDIES

On the empirical ground, the relationship between health care and tourism has been considered in many studies. Goodrich (2002) studied the relationship between health care and tourism for the US during the 1980-2000. He found that the effect of health care on international tourism has been positive in the long-run. Hundt (2005) has investigated the impact of tourism development on the health care in developing countries over the period of 1980-2003. The results of this study reveal that tourism development has a positive effect on the health care in selected countries. In other study, Connell (2006) has evaluated the impact of tourism on the health care of 10 developing countries. Their findings indicate that tourism development has a positive and significant effect on the health care in these countries. Ging Lee (2010) has analyzed the relationship between health care and international tourism in Singapore during the 1980-2007. The results of this study suggest that there is a long-run unidirectional causality from health care to international tourism. The effect of health care on international tourism is positive. However, in the short-run, the results indicate that there is no causality between these two variables. Using a panel data approach, Smith et al (2011) investigated the effect of medical tourism on the bi-lateral trade of the UK and India during the 1990-2009. They found that health care development has a positive and significant effect on the bi-lateral trade of those two countries. Kushi and Caca (2010) provided an analysis of the main characteristics of MSMEs in this sector and identifies the existing problems using data from 83 holiday hotels during summer 2006 in Durres region, which is the major sun-and-beach segment in Albania. The results of the survey are in line with the general economic situation in Albania which is characterized by the dominance of micro and small-sized enterprises, mainly family businesses. In another study, Crooks (2011) analyzed the impact of medical care on international tourism in the case of India over during 1975-2008. The empirical results of this study shows that medical care has a positive and significant effect on tourism attraction in this country. Heung et al (2011) by using Johansen's co-integrating technique have analyzed the impact of health care on international tourism in Hong Kong over the period of 1990-2007. They concluded that in the long-run there is a positive relationship between two variables. Yu et al (2011) have investigated the effect of health care on international tourism in South Korea during 1992-2009. The results of this study suggest that the improvement of health care has a positive effect on the attraction of international tourist's in this country. Taleghani et al (2011) by adopting the panel data approach has analyzed the role of health tourism in development process for 30 developing countries. Their findings reveal that health tourism has a positive impact on the economic growth in these countries. Lertwannawit et al (2011) have investigated the relationship between health care quality and international tourism in Thailand over 1985-2008. The results of this paper show that there is a significant positive relationship between service quality and tourists' arrivals in this country. By applying panel data approach, Yu and Ko (2012) have investigated the effect of medical care on the international tourism of the countries China, Japan and Korea during the 1980-2009. Their findings indicate that medical care has a positive effect on tourism in these countries. Hudson and Li (2012) have examined the relationship between medical care and international tourism in the US over the 1980-2010. They noticed that the medical care has a positive effect on international tourism in the long-run. Asprogerakas (2012) has analyzed the use of taxation electronic applications, particularly popular as EG applications, in Greece. In the EU, ICT in fact functions merely as a means of realization within pre-existing political, social and economic structures a fact posing restrictions in terms of the results of their potential use. E-Government applications are a more immediate way for the citizen to get in contact with public services and a mechanism of accelerating administrative procedures. There is a lack of contribution to the cohesion of policies and actions. The

constitution of telematics nets and the use of technological applications are the main mechanisms leading to the notion of “electronic space” challenging at the same time the traditional view of accessibility and the functional organization of space. The inferior position concerning conventional accessibility as well as the multi-fragmentation of a spatial unity are distinguished as major factors for the development of EG applications together with the existence of a major urban center. Moreover there is at least some evidence that the use is related to the predominant activity of the area in question with tourism acting as a familiarization tool with the internet and its applications. Avdi (2013) focused on the system of contributions for health insurance scheme. The paper will argue the need for immediate measures regarding this issue. Based on the primary and secondary data, through an economic analysis is studying the trend of contributor’s number for five years. Are identified the economic, social and political factors, that affect this process and whole health insurance scheme (HIS). In Albania, partly scheme function, an informal labor market, lack of incentives for participation in health scheme, weak administration capacity for contributions collecting and poor structure, regulatory and supervisor and all in all its funding challenges, are the main factors that accompanies for years the health care system and as the result the contributions system for health insurance. Baboe (2015) conducted in villages Rabauh, Tanjung Untung and Hantapang, Gunung Mas district, Central Kalimantan. The research uses descriptive analytical. The data collection is taken through observations and questionnaires on the relevant program, institutions and community groups. Rabauh rural women's participation in PM2L particular on basic infrastructure development program is inactive. Their involvement only as a receiver and connoisseurs of such assistance. Similarly, at the village of Tanjung Untung and Hantapang. The participation of rural women in PM2L in Gunung Mas is not directly involved due to most activities are carried out is handle by government agencies. Feshari et al (2016) have investigated the long-run relationship between tax ratio to GDP and tourism receipts in OIC selected countries during the period of 1990-2014. The main findings of this study reveal that tax ratio has negative effect on the tourism receipts and GDP per capita and its growth have positive and significant effect on the tourism receipts in Islamic selected countries. Hence, the main policy implication of this paper is that the tourism managers in these countries should adopts policies to improve the tax revenue through the increase of product capacity. Moreover, the increasing of GDP per capita can improve the tourism receipts in these countries. Lyberaki et al (2017) tested whether and to what extent inequalities persist in retirement. It does so by direct comparisons of privileged groups relative to less privileged groups of a large international sample survey of individuals aged 50+, the Survey of Health, Ageing and Retirement in Europe (SHARE), using the fifth wave conducted in 2013. The comparison proceeds by means of odds ratios applied to dimensions of outcomes related to well-being: life satisfaction; better health; chances of a better financial status. This is done for cases of pensioners where the key distinguishing feature is simple presence of someone who used to be employed worked in the public sector. This comparison is also applied at a household level, where in addition to the public-sector effect, hypotheses related to the male breadwinner model can also be approached. The results in general confirm that public sector retirees tend to fare better than their coevals, even with the relatively blunt statistical instrument checking for overall outcomes.

In the case of Iran, it can be argued that none of the studies have explored the short and long-run relationship between health care and international tourism. But in closer and similar studies, Mosaei (2004) estimated the international tourism demand for Iran using data for the period of 1971-2000. The results of this study indicate that the cost of living in one’s home country has a negative effect and world income has a positive and significant effect on the international tourism in Iranian economy. In other study Taghavi and Gholipour Soleymani (2009) evaluated the main determinants of the tourism industry in Iranian economy over the 1978-2007. Their results show that nominal exchange rate, tourism receipts and cost of living are the main factors of tourism industry.

Mohammadzadeh et al (2010) by employing the TVP approach estimated the international tourism demand for Iran using data over the 1971-2006. They found that world income, taste and habit have a positive effect and 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 and et al (2010) have estimated the tourism demand function for Iran by using TVP. In this paper, India, Turkey and Pakistan have been selected as the origin countries for travel to Iran. The empirical results indicate that income and habit have a positive and 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 of Pakistan and India.

By review of empirical studies on the relationship between health care and international tourism, it is revealed that none of the previous studies have examined the relationship between two variables. Hence, the main contribution of this paper is to investigate the short-run and long-run relationship between health care and tourism in Iran by applying Toda-Yamamoto and DOLS approaches.

4. MODEL SPECIFICATION AND DATA SOURCES

In this paper a modified version of the Granger causality test proposed by Toda and Yamamoto (TY) (1995) and the Fully Modified Least Square (FMOLS) have been used for investigating the short-run and long-run relationship between health care and international tourism in Iran. Toda and Yamamoto (1995) procedure based on augmented VAR system and a Wald test statistic that asymptotically has a chi square distribution. In Toda and Yamamoto (1995) approach, the augmented ($k+dmax$) the order of VAR estimated where k is the lag length of the system that can be selected by using of information criteria such as AIC and SC. $dmax$ is the maximum order of integration. One of the main characteristics of Toda and Yamamoto causality test is that it can be applied when there is no co-integration relationship between variables and does not require knowledge of the integration and properties of the system (Akcaay, 2011).

The Toda-Yamamoto model can be specified as following bi-variate VAR system:

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

In above formula, x_{1t} and x_{2t} are the international tourism and health care indices respectively. After investigating the short-run causality test between health care and international tourism, the FMOLS approach has been used for estimating the long-run relationship between health indicators and number of tourist arrivals. A Fully Modified Least Square (FMOLS) co-integration approach originated by Phillips and Hansen (1990) that provides optimal estimates of co-integrating regressions. This method modifies least squares to explain the serial correlation effects and for endogeneity in the regressors that arise from the existence of a co-integrating relationship. The FMOLS estimator employs initial estimates of the symmetric and one sided long-run covariance matrices of residuals. For explain the FMOLS method, consider a linear static regression:

$$y_t = \beta_0 + \beta_1' x_t + u_t \quad (2)$$

In above equation, y_t represents the dependent variable and x_t is the ($K \times 1$) vector of covariates.

Moreover, let $\Delta x_t = \mu + w_t$; 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, $\hat{\Gamma} = \frac{1}{T-1} \sum_{t=2}^T \hat{\xi}_t \hat{\xi}_t'$, $\hat{\Phi} = \sum_{s=1}^m w(s,m) \hat{\Gamma}_s$; $\hat{\Gamma}_s = T^{-1} \sum_{t=1}^{t-s} \hat{\xi}_t \hat{\xi}_{t+s}'$ and $w(s,m)$ is the lag truncation window.

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

$$\hat{B}_{FMOLS} = (W'W)^{-1} (W\hat{y}^*) - TD\hat{Z} \quad (3)$$

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

If the error term obtained through FMOLS proves stationary, then y and x variables in equation (2) are co-integrated. The stationary of error term can be tested by any classical unit root tests.

In this paper, the dependent variable has been defined as number of total tourist arrivals to the Iran (TOUR) and variables of number of doctors (D), hospital beds (HB), number of dentists (DEN) has been considered as explanatory variables.

The annual time series data for the number of doctors, hospital beds, number of dentists and number of total tourist arrivals to the destination country (Iran) as a proxy for international tourism have been collected from Iran Statistical Center and Central Bank of Iran over the period of 1971-2016.

5. EMPIRICAL FINDINGS

In this section, the results of short-run causality and long-run estimation of co-integrating vector have been reported. The short-run Causality Test was carried out by employing the Toda-Yamamoto (1995) procedure. The first step in this approach is to determine the maximum order of integration of the variables (dmax), for this purpose we need to perform a unit root test. The results of Augmented Dickey-Fuller and Philips-Perron unit root test Presented in Table 1.

Table.1. Results of unit-root test

Variable	ADF Test Statistics		PP Test Statistics	
	Constant	Constant and Trend	Constant	Constant and Trend
LTOUR	-0.21*	-1.43*	-0.32*	-1.16*
LHB	-2.54**	-2.69**	-3.48**	-2.87**
LDEN	-0.29*	-1.12*	-0.29*	-1.58*
LD	-0.78*	-4.89**	2.79**	-4.26**

* & ** indicate that variable is I(1) and I(0)

The results of ADF and PP unit root test indicate that LTOUR and LDEN are integrated of order one or I(1) and LD and LHB are I(0).

The next step in Toda-Yamamoto causality test is to determining the optimal lag length (k), with respect to the size of our sample, we used the SC Information Criteria. The results show that the optimal lag length is $k=1$. After investigate the integration of series and finding optimal lag, we can perform Toda-Yamamoto causality test. The results of Toda-Yamamoto causality test has been shown in Table 2.

Table2. Results of Toda-Yamamoto Causality test

From LHB to LTOUR		From LDEN to LTOUR		From LD to LTOUR	
χ^2 Statistics	P-Value	χ^2 Statistics	P-Value	χ^2 Statistics	P-Value
3.98	0.12	7.23	0.034	11.08	0.0012
From LTOUR to LHB		From LTOUR to LDEN		From LTOUR to LD	
χ^2 Statistics	P-Value	χ^2 Statistics	P-Value	χ^2 Statistics	P-Value
0.59	0.72	3.78	0.14	4.87	0.08

Source: Authors Computations

The results of causality test indicate that there is unidirectional causality from number of doctors and doctors to the number of tourist arrivals at 5% significance level and unidirectional causality from the number of dentists to the number of tourist arrivals at 10% level. Moreover we cannot find any causality from tourist arrivals to the indicators of health care.

To estimate the long-run relationship between health indicators and international tourism, we used the FMOLS method. The co-integrating equation has been estimated by inclusion of 1 lags and leads. The result of model estimation has been reported in Table 3.

Table3. FMOLS estimates of Co-integrating equation

Health Indicators:	Explanatory Variables	Coefficient	t-Statistics	P-Value
Number of Doctor	C	3.32	1.69	0.09
	LD	0.87	4.61	0.000
	DU	-0.77	-2.23	0.032
	$R^2 = 0.47, \bar{R}^2 = 0.44, \text{Long-run Variance}=0.71$			
Number of Dentist	C	3.15	1.98	0.054
	LDEN	1.04	5.86	0.000
	DU	-0.65	-1.7	0.09
	$R^2 = 0.79, \bar{R}^2 = 0.78, \text{Long-run Variance}=0.82$			
Number of Hospital Beds	C	-15.64	-2.22	0.032
	LHB	2.47	3.99	0.003
	DU	-1.10	-2.31	0.026
	$R^2 = 0.68, \bar{R}^2 = 0.66, \text{Long-run Variance}=1.4$			

Source: Authors Computations

The results of model estimation by employing FMOLS suggest that the elasticity of international tourism with respect to the number of doctors is 0.87 and the dummy variable has a negative and significant effect on the number of tourist arrivals. In the second model, the number of dentists as a proxy for health care has a positive effect on international tourism and its elasticity is 1.04. The coefficient of dummy variable in this model is -0.65, which represents the war effect. In the third model, we include hospital beds as a proxy for health care; the empirical results indicate that a hospital bed has a positive and significant impact on the tourism demand. In this case, the dummy variable has the negative and significant effect on the number of tourist arrivals in the years of war (1980-1988). In other words, in that period, the number of tourist arrivals has decreased significantly.

6. CONCLUDING REMARKS AND POLICY IMPLICATIONS

The main aim of this paper is to investigate the short-run and long-run relationship between indicators of health care and the number of tourist arrivals as a proxy for international tourism in the Iranian economy over the period of 1971-2016. For this objective, the Toda- Yamamoto and FMOLS approaches has been used for investigation of short-run causality and long-run relationship. The empirical results of TY causality test suggest that there is unidirectional causality from the number of doctor and dentist to the international tourism, but we cannot find any causality from international tourism to the indicators of health care. Moreover the results of FMOLS method indicate that in the long-run, the numbers of doctor and dentist have a positive and dummy variable has a negative and significant effect on the international tourism of Iran over the period of study. The main result of this study is consistent with the economic theories and empirical studies such as Ging Lee (2011), Smith and et al (2011), Connell (2006) and Page (2008). With respect to the results of this paper, we can conclude that development of the health care sector has positive effects on international tourism. Hence the main policy implication of this study is that the policy makers should adopt policies for improving health care and attracting more international tourists.

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