The Relationship between Tourism and Environmental Performance: The Case of Caspian Sea Nations

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Abstract
Tourism is a multidimensional economic activity that has an interaction with the environment. On one hand, environmental resources provide the raw material for tourism, while on the other, tourism imposes a variety of negative and positive impacts (wanted or unwanted) on the environment through the creation of various by-products. The main purpose of the current study is to investigate the relationship between tourism and environmental performance in the Caspian Sea nations during 2002-2013. A panel data vector autoregressive (P-VAR) method has been employed to estimate the model. Findings from the impulse-response function analysis and variance decomposition show that the reactions of international tourism to environmental performance, human development index, gross domestic product (GDP) per capita, and the degree of trade openness in the Caspian Sea nations are positive. Moreover, the reaction of environmental performance to tourism and GDP per capita shocks is negative. The results also show that the responses of environmental performance to human capital index, the degree of trade openness and the square of GDP per capita shocks are positive. According to the findings, it is suggested that countries in the Caspian Sea region should pay a special attention to environmental issues in the development of tourism.

1. Introduction

The dissolution of former USSR in early 1990s and the end of the Cold War caused major developments in geolocation of the world, especially the Caspian Sea nations. The Caspian Sea has a strategic importance because of its geographical location, rich supplies of oil and gas, and the newly independent states. The five countries located in this region, having an overall population more than 245 million people, having access to enormous reservoirs of oil and gas, and benefitting from a privileged geographical location, are the center of global attention and a competing field for regional and world powers. Such special status for the region has provided suitable international potentials. The Caspian Sea bridges Iran and Russia with Central Asia and Caucasus; consequently, countries located in the Persian Gulf, the Mediterranean Sea, and the Black Sea regions, in addition to Pakistan and Afghanistan, could connect with each other and Europe more easily. The Caspian Sea is also called "the Pearl of Eurasia" because of its connecting function between Asia and Europe (Zeinolabedin et al., 2009). The combination of such geographical factors has provided an appropriate ground for investment. The specific condition of The Caspian Sea, as the largest body of water in the world, has always been a challenge among scientists and technicians. For decades, oil and gas industries have been involved in discovering and drilling; food experts have praised caviar and its properties, and those involved in ecological resources have valued the biological diversity in the sea and considered its potential for continental transportation and creation of job opportunities with regard to marine foods and tourism. Therefore, the Caspian Sea is a symbol of combined opportunities in the regional and global level. Certainly, the Caspian Sea is important and attractive not only for the regional countries, but also for many nations around the world (National Geological Database[1], 2015).

A multitude of factors targets the environment surrounding the Caspian Sea, each of which could lead to erosion. This might deprive nations to benefit from its resources or make such a process very expensive. Some of these factors are generated from each other and might lead to conflicts with goals and interests of countries in the region and prevent them from being fulfilled. Although tourism could be considered as the key or secret for economy in the developed and the developing countries, it imposes a great and immediate threat to the ecosystem of the Caspian Sea. Therefore, though environment could

defend itself against a certain level of pollution, environmental disasters start when human beings increase the amount of pollutants and overwhelm natural cleaning processes. Some experts believe that the major causes of marine pollution include lad-based facilities, drilling in the sea, dumping poisonous waste, dumping atomic waste, ships, atmosphere, and deep-sea drilling and discovery. They also believe that fluctuations in the sea level, biological issues (biological damages caused by the erosion of land and air pollution), ecological problems (change in land use, especially that of agricultural areas or depreciation of aesthetics and architecture), activities related to oil drilling and industry, wastewater (agricultural or urban and domestic sewage near seashores), and the waste made by tourists are the major threatening factors against the Caspian Sea environment (Mola et al., 2012). Since long-term environmental problems could not be solved by the rapid application of technologies, permanent growth would be focused on by having an understanding of the correlation between protecting the environment and economic growth.

Tourism is defined as an industry that is involved in leisure and travel (Cunha and Cunha, 2005) and has turned into one of the fastest-growing sectors of economy within the past few years. This increase has been so much that tourism has been of great help to the economic growth of countries and economic advantages of local communities (Osman and Sentosa, 2013). According to the annual report issued by the World Tourism Organization (WTO, 2015), the number of travelers in 1980 was only 227 million that reached 677 million in 2000 and 1133 million in 2014. In addition, international earnings of tourism have increased to $1245 billion. Such a number constitutes 30 percent of global exports and 6 percent of the overall global trade, resulting in a 9 percent growth in gross domestic production in the world. All these statistics and figures indicate the growing and fast trend in tourism industry. Investigation in the current study on the Caspian Sea nations[2] during 2002-2013 confirms this trend, too. In this regard, the report issued by WTTC[3] in 2015 indicates that the share of tourism on establishing new job opportunities is 7.6 percent for Azerbaijan[4], 5.3 percent for Iran, 5.6 percent for Russia, and 5.3 percent for Kazakhstan. In addition, the share of tourism on gross domestic products of the Caspian Sea nations has been found as quite differing (8.4 percent for Azerbaijan, 6.3 percent for Iran, 6.0 percent for Russia, and 5.6 percent for Kazakhstan)[5]. Long-term economic success in

tourism often requires the maintenance of natural quality of the environments in order to fulfill tourists' needs (Holden, 2007).

Since tourism has been recognized as a very promising financial support in protected areas, it could be concluded that earnings made by it in such areas could change the perception of local communities with regard to the environment (Sirivongs and Tsuchiya, 2012; Coad et al., 2008) and increase protection on the environment (Imran et al., 2014). The introduction of this "conception of tourism as a system" establishes a connection between the environment of targets for tourism and local communities. In this manner, the unique environment of the Caspian Sea has established appropriate conditions for tourists, especially eco-tourists. However, environmental and land-use changes in the Caspian Sea for the purpose of expanding tourism has (directly and indirectly) destroyed natural habitats and degraded coastal areas. In addition, unique ecological capabilities together with its international ponds, forests, rivers, animals, and plants have diminished gradually. The population of some species is decreasing fast and some of them face the danger of extinction. Furthermore, deforestation, desertification, and reduction of fish resources because of illegal fishing practices are among the major problems in the region. Normally, expansion of tourism is accompanied by investment, construction, and establishment of infrastructure such as hotels, accommodation centers, villas, and roads. However, unplanned construction along the coastal line has made detrimental impacts such as the loss of attractive natural sceneries, soil degradation, and environmental damages (Mola, et al., 2012).

Countries in the Caspian Sea region are among the richest areas with regard to energy resources and depend largely on the oil exports. The region has a particular geographical location (prosperous forests, rich agricultural lands, and huge subterranean and sea resources) and benefits from a high potential to attract tourists that could reduce vulnerabilities caused by fluctuations in the price of oil and the subsequent problems arising from a single-product economy. Nonetheless, the region has witnessed horrible consequences of pollution in the coasts and the environment during the past few years in a way that according to the data provided by Yale University, the index of environmental performance in the region has been reported as 50 or lower, which could be attributed to tourism to some extent. In addition, because of the importance of variety in the rich ecosystem of the Caspian Sea including ponds, forests, rivers,

vast plains and prairies, and beautiful sea shores and river estuaries has created a great potential for ecotourism. Such ecotourism, if planned and managed meticulously, would provide potentially significant sources of revenues and would be a proper tool for educating and raising the consciousness of interested people, both within and outside the country. In spite of the presence of this huge potential, tourism in the region is not properly planned yet and these areas are left without any proper use since there are no due plans and services. The mutual relation between environment and tourism is a reason to investigate the issue here and in this regard, the set of selected countries has been chosen meticulously. In so doing, countries located in the Caspian Sea region have been chosen to be investigated in the current study. The current study attempted to answer the following questions:

1. Is the reaction of tourism toward environmental performance positive?

2. Is the reaction of environment toward impulses resulting from tourism industry negative?

It should be mentioned that various studies have been conducted on the relationship between tourism and environment; the most notable ones could be Rasekhi et al. (2016) that has attempted to investigate the impact of tourism on environment for 55 developing and developed countries by making use of panel data. In that study, it was found that the impacts of tourism on the environment of developed and developing countries were positive and negative, respectively. Nonetheless, the current study has some distinguishing characteristics from the other studies. First, based on the literature in the economic and social studies, it studied the mutual interaction between tourism and environment simultaneously. Second, it has used the auto regression model in the form of panel data (P-VAR). In addition, none of the previous studies has investigated the Caspian Sea region, while the current study has investigated the relationship between tourism and environmental performance in The Caspian Sea nations during 2002-2013. Specifically, the hypotheses in the current study included the following: 1. Tourism has positive a reaction toward the environment. 2. The environment has a negative reaction toward tourism. Table 1 summarized the related experimental studies.

Table 1. Summary of Experimental Studies on the Relationship Between Tourism and the Environment

Title	Authreor	Estimation Method	Study Area	Major Findings
Tourism Development Vs CO_2 Emissions in Thailand	Jatuporn and Chien (2011)	By using a multivariate vector autogressive (VAR) model and generalized variance decomposition (VDC)	Thailand (January 1986 to May 2010)	Tourism development increases the consumption of energy and CO_2 emissions through transportation and economic activities. The results also showed that transport sector has a strong relative shock on CO_2 emissions through the time prediction.
Co_2 emissions and international tourism in some developed countries	Nademi (2011)	By using panel data analysis (2000-2007)	Selected developed countries	The impact of CO_2 emission towards international tourism in a few Developed Countries are significantly negative suggesting that policymaking is crucial in order to reduce the pollution level.
Exploring the relationship between tourism development indicators and carbon emissions	Zaman et al. (2011)	By employing co-integration and Granger Causality test	Pakistan (1991-2010)	The results indicated a bi-directional relationship between tourism indicator and Carbon emission.
A study of the relationship between carbon emission and tourism development in Maldives.	Amzath and Zhao (2014)	By using Ordinary Least square Method	Maldives (1972-2010)	Regression results showed a very significant positive correlation between tourism development indicators and carbon emission. The relationship between carbon emission and tourism development shows very directional positive relationship
The Dynamic Linkage between CO_2 emissions, Economic Growth,	Ben Jebli et al. (2014)	By using co-integration test and Granger causality panel on panel data	South America (1995-2010)	In the long term, a mutual causal relationship exists between the number of tourism, consumption of renewable energies, and CO_2 emission. In other words, tourism and consumption of renewable

Title	Authreor	Estimation Method	Study Area	Major Findings
Renewable Energy Consumption, Number of Tourist Arrivals and Trade				energies lead to reduction in CO_2 emission, while economic growth and trade cause its increase.
International tourism, energy consumption, and environmental pollution: The case of Turkey	Katircioğlu (2014)	By using the Model (ARDL-ECM)	Turkey (1960-2010)	The reaction of energy consumption, and CO_2 emissions, to tourism development is positive. This implies that tourism development has resulted not only in considerable increases in energy use but also increases in climate change, as demonstrated by the econometric analysis.
Estimating tourism-induced energy consumption and CO_2 emissions	Katircioğlu et al. (2014)	By using Error Correction Model (ECM) and Granger causality	Cyprus (1970-2009)	Results revealed that international tourism is in a long-run equilibrium relationship with energy consumption and CO_2 emissions. International tourism was found to be a catalyst for energy consumption and for an increase in the level of CO_2.
Tourism Expenditures and Environment in Thailand	Somphol krang (2014)	by the use of VAR model and Granger causality test	Thailand (1988-2012)	A direct, mutual, and causal relationship exists between major aspects of the environment (CO_2 emission resulting from transportation, need for energy, and water consumption) and costs of tourism.
Tourist arrivals and macroeconomic determinants of CO2 emissions	Solarin (2014)	Using panel cointegration and causality tests	Malaysia (1972-2010)	Long-term, positive, and one-way relationship exists between environmental pollution on one hand and tourism, gross domestic production, energy consumption, urbanization and financial growth on the other.

Title	Authreor	Estimation Method	Study Area	Major Findings
Causal Interactions Between CO_2 Emissions, Financial Development, Energy and Tourism	Başarir and Çakir (2015)	Using unit root tests, cointegration and causality panel	Turkey and four European Union countries (1995-2010)	There were statistically significant feedback effects between the variables. The causality analysis shows uni-directional causal relationship between the tourist arrivals and financial development. Also there was a bi-directional causality relationship between CO_2 emission, financial development, and energy and tourist arrival.
Environmental Impacts of Tourism	Rasekhi et al. (2016)	Using panel data Method	Selected Developing and Developed Countries (2005-2012)	The results indicate that the impact of tourism on the environmental performance is positive for developed countries, while the effect is negative in developing countries. The other results of this study show that energy intensity, the urban population, the Industry, value added and the Population density have a negative and significant effect on the environment while the human development index and the degree of trade openness have a positive impact on environmental performance.
Tourism and CO_2 emissions nexus in Southeast Asia: new evidence from panel estimation	Sherafatian-Jahromi et al. (2016)	Using the panel cointegration and pooled mean group techniques	the five most important countries located in Southeast Asia (1979-2010)	The results indicate that the nonlinear relationship between tourism and emissions as well as economic activities and CO_2 emissions. Accordingly, an inverted U-shaped relationship exists between tourism and emissions confirming the existence of an Environmental Kuznets Curve in the Southeast Asian tourism industry.

Title	Authreor	Estimation Method	Study Area	Major Findings
Tourism development, energy consumption and Environmental Kuznets Curve: Trivariate analysis in the panel of developed and developing countries.	Zaman et al. (2016)	The study used the principal component Analysis (PCA) to construct tourism development index and two-stage least squares panel	East Asia & Pacific, European Union and High income OECD and Non-OECD countries (2005-2013)	The results validated the inverted U-shaped relationship between carbon emissions and per capita income in the region. The results further substantiated the following causal relationships tourism-induced carbon emissions, energy-induced emissions, investment e induced emissions, growth led tourism, investment led tourism and health led tourism development in the region.

The study has been organized in the following manner: First, an introduction has been presented. Then, the theoretical foundations of the study have been dealt with, while the third section involves an estimation of the model and data analysis. Presentations of the experimental results, conclusions and suggestions for policy-makers have been made at section four and five. References have been presented at the end of the article.

2. Review of Literature

Expansion of tourism and the arrival of tourists have caused numerous economic, socio-cultural, and environmental impacts on the target areas. Therefore, within the past few decades, the number of studies on tourism has been increased. Despite this, it seems that a comprehensive and coherent theoretical foundation does not exist for the relationship between expansion of tourism and the environment (especially with regard to economics), though various viewpoints on the relationship between tourism and environment could be mentioned within the framework of contemporary theories.

Attention to the importance of tourism and environmental quality could be traced back to the study published in 2002 by Kort, et al. (Zaman et al., 2016). No matter what form of industrial development occurs, it would definitely have impacts upon the physical environment where it has happened. Regarding the fact that tourists must see the

production place to make use of the output, it is an inevitable point that tourism is related to the environmental impacts (Cooper et al., 1998). The relationship between environment and tourism implicates complex interactions and could be described as a mutual relationship. Tang (2015) argues that understanding the relationship between tourism and the environment is important because of the complex interaction of the environmental impacts arising from tourism. Holden (2007) believes that tourism would not be attained without having an understanding of the natural attractions in the destination environment.

Brida and Pereyra (2009) argue that a mutual dependency exists between higher shares of tourism and the environmental quality. In other words, on one hand tourism industry and all other economic practices impact the environment directly, leading to the investment of those interested in tourism in the quality of the environment and sustainable use of local resources. On the other hand, tourism is dependent on the natural environment so much that the quality of environment in the target area is one the major factors for demands of tourism. Findings of many studies (e.g., Clewer et al., 1992; Sinclair and Stabler, 1997; Huybers and Bennett, 2000) show that the quality of environment is important for tourists in a way that they are willing to pay more money to visit a high-quality environment. Studies such as Sekhar (2003), Novelli and Scarth (2007) and Campbell et al. (2013) indicate that economic motives increase people's motivation in order to protect the environment, especially in remote areas. In addition, McKercher (1993) argues that the environment is a fundamental element of the tourism experience. Tourists seek out attractive, different, or distinctive environments that might support specific touristic activities. At the same time, however, tourism is resource-hungry; the development and practice of tourism consumes resources, creates waste, and requires significant infrastructural development (Sharpley, 2009).

Lee and Brahmaserene (2013) argue that the tourism industry is no longer regarded as a "smokeless" industry accompanying the improvement of environmental consciousness. Tourism often involves travel and accommodations, which rely on fossil fuels for the transportation of tourists to and from as well as within destinations and for hosting tourists. Despite this impact, climate change significantly affects the tourism industry, most importantly due to its effect on the attractiveness of tourism destinations and tourist flows (Amelung, et al.

2007; Lise and Tol, 2002). In addition, tourism depends on natural resources such as water, coastlines, landscapes, and biodiversity which influence the potential attractions of tourism destinations (Yazdanpanah, et al., 2016). Goudie and Viles (1997) argue that tourism could drive the destruction of environment.

Therefore, some scholars (e.g., Hall, 1998; Boyra, 2009; Dodds and Butler, 2009; Zhong et al., 2011) point out that environmental degradation generated by tourism development along with a lack of specialized and integrated management for the preservation of natural resources bring about economic decline to many tourism destinations.

As mentioned in Ryan (2003), the environment is usually considered as a major element of tourism. Fundamentally, all aspects of tourism involve this. Nonetheless, the natural environment is quite delicate and requires special care, while in fact, it helps tourism through its natural features firsthand.

As a result, tourism itself has become an increasingly complex phenomenon on one hand, having political, economic, social, cultural, educational, bio-physical, ecological and aesthetic dimensions while on the other, natural environments, cultural heritages, and their diversities are major attractions that tourism could offer. The attainment of proper and desirable correlation between tourism and environment or between the potentially conflicting expectations and aspirations of visitors and host or local communities could create many challenges and opportunities (Farajirad and Aghajan, 2010).

Laws (1991) theorizes that the advantage of interpreting "tourism as a system" is that it avoids a one-dimensional thinking style and facilitates a multidisciplinary perspective. In addition, Urry (1995) argues that a tourist's goal is visiting a special environment, one that has a social structure and cultural attraction. Urry believes that social, cultural, and environmental changes could alter the perception of what is considered the favorable scenery.

Gössling (2002) believes that tourism acts as a major player in global changes of the environment and is affected itself. According to Sompholkrang (2014), tourism affects and is affected by the environment both directly and indirectly. First (and specifically), environment is considered as an attraction and a product of tourism. If the destination is crowded because of increased numbers of domestic and international tourists, the environment is at risk and tourists might choose other modes

of travel. In addition, tourism expansion leads to increased demands on water and sewage facilities. Furthermore, tourist's rush leads to noise pollution, erosion of river banks, crowdedness, heavy traffic and the related types of pollution, etc.

Therefore, tourism could play a major role in the protection of natural habitats and wildlife against various destructive forms of development (e.g., mining) or prevent other damaging forms of human activities (e.g., illegal hunting) through the earnings made by tourists' visit.

3. Model Specification and Data Description

Because of its multiple advantages and with regard to the limitations inherent in time-series models to be applied for short-term periods (such as statistical limitations and uncertainty on whether a variable is endogenous or exogenous), the panel-VAR data method could eliminate these concerns by implementing an auto-regression model. The panel-VAR data method includes the traditional VAR approach, though here, panel data are being used. Using this method, the relationship between the dependent variable and the previous values of other variables could be explained and evaluation of the impact of shocks on endogenous variables could be investigated. This method has been implemented in the current study in congruence with the topic being investigated and the literature (e.g., Grossmann et al., 2014; Jawadi et al., 2016). In addition, the above system has been structured in a way that each one of the two variables could influence the other. In its general form, the model is illustrated as follows:

$$Y_{it} = \Gamma_0 + \Gamma(L)Y_{t-1} + \vartheta_i + d_t + \varepsilon_{it} \qquad i = 1, \dots, N \quad t = 1, \dots, T_i \qquad (1)$$

where Y_{it}, is a vector of endogenous variables, Γ_0 is a vector of constants, $\Gamma(L)$ is a matrix polynomial in the lag operator, ϑ_i are country specific fixed effects, d_t are country specific time effects, and ε_{it} is a vector of error terms. Y_{it} includes several variables such as Tourism (the number of arrivals tourists), EPI (Environmental Performance Index), HDI (Human Development Index), GDP (Gross Domestic Production per capita), GDP (square of GDP per capita), and OPEN (the degree of trade openness). The selection of variables in the model has been based on the theoretical foundations proposed in the studies conducted by some researchers such as Lee and Brahmaserene (2013), Katircioğlu (2014), and Alam et al. (2011).

Since the mixed environmental index of the Yale institute of

environmental policies and regulations summarizes environmental conditions and according to its investigations, the mentioned index has considerable advantages compared with the singular indices of pollution, the environmental performance index (EPI) has been investigated as the dependent variable in the current study. It should be mentioned that according to the theoretical foundations presented in the study, the relationship between tourism and environment is complex and is based on a mutual coexistence. Particularly, this relationship such that in it, the researcher benefits from the high-quality environment and in response, has a responsibility towards the environment and should conduct actions in order to protect and maintain environmental values. Nevertheless, if tourism is not accompanied by proper planning and execution, destruction of natural resources and attraction would happen.

One of the influential factors on tourism and environmental performance is human development index (HDI). Through economic, social, and cultural (education, health, and security) development, human development index attracts and increases the number of tourists (Croes, 2012; Mehrgan et al., 2012; Musai et al., 2011). In addition, this index, as one of the indices of development, could lead to the protection of the environment through enhancing the quality of life (Samimi et al., 2011; Gürlük, 2009; Alam et al., 2011).

Furthermore, economic growth causes the expansion of tourism through the development of facilities and infrastructure for tourism such as accommodation centers, transportation systems and roads, and development of facilities for entertainment and welfare (Katircioğlu, 2009; Payne and Mervar, 2010; Cortés-Jiménez et al., 2011; Bouzahzah and Menyari, 2013). In 1955, Kuznets proved that a Downward U-shaped relationship exists between income per capita and inequality in income. The equation between economic growth and indices related to pollution and quality of environment is well known as Environmental Kuznets Curve (EKC). What is meant by this equation is that in the earlier years of economic growth, the amount of environmental degradation increases, though the environmental condition improves after a certain level of growth is attained. In other words, the rate of destruction imposed on the environment decreases at higher levels of economic growth (Stern et al., 1996; Cole, 2004; Peng and Bao, 2006; Awan and Awan, 2013; Tugcu, 2014; Conrad and Cassar, 2014; Wolde, 2015). Therefore, although the economic growth is the main objective of many economic policies in

governments, rapid economic growth imposes serious harms against the environment (because of the increased use of natural resources and emission of greater volumes of pollutants) (Salahuddin et al., 2015; Zhang and Gao, 2016). Therefore, a potential contrast exists between policies of economic growth and environmental conditions. Some other researchers (e.g., Beckerman, 1992; Zhang et al., 2008; Yang et al., 2012), on the other hand, believe that economic growth is essential in order to have a healthier environment and eradicate poverty.

Furthermore, open trade could be considered an important catalyst for the development of tourism industry, in a way that high levels of open trade could increase access to markets and services in areas such as tourism. In addition, open trade has positive impacts on international activities and trade corporations (Keintz, 1968; Turner and Witt, 2001). Furthermore, making trade free through increasing competition accompanied by the reduction of prices for domestic products, increased quality, and higher variability could lead to development and growth in the tourism industry within the destination countries (Summers and Heston, 1991; Dwyer, et al., 2000; Gooroochurn and Sugiyarto, 2004). With regard to the impact of trade openness on the environment, two differing viewpoints exist. The first is that trade openness has a negative impact on the environment through the transfer of pollutant industries to countries that have less strict environmental regulations (Talberth and Bohara, 2006; Halicioglu, 2009; Tamazian and Rao, 2010). According to the second viewpoint, with regard to the reactions made by countries to the competitive forces arising from open trade and the availability of relative advantage, they attempt to make use of efficient resources; therefore, waste of resources and energy, together with their resulting pollution, is reduced (Munasinghe, 1993; Zhang, 2007; Alam et al., 2011; Shahbaz et al., 2013). Definitions and manner of measuring variables in the current study have been summarized in Table 2.

Table 2. Definition and Measurement of Variables Used in the Current Study

Variable	Symbol	Description	Data Source
Tourism	TOUR	The number of arrivals tourists	World Bank (2015)
Environment	EPI	Environmental performance index	Yale Center (2015)
HDI	HDI	Human Development Index	UNDP[6] (2015)

Variable	Symbol	Description	Data Source
GDP	GDP	GDP per capita	UNCTAD (2015)
GDP^2	GDP2	The second potential GDP per capita	UNCTAD (2015)
Degree of economic openness	OPEN	The overall export and import on GDP	World Bank (2015)

Descriptive statistics related to the research variables have been presented in Table 3.

Table 3. Descriptive Statistics of the Major Variables in the Current Study for the Caspian Sea Nations During 2002-2013

Country / Mean	TOUR (number of tourists)	EPI	HDI	GDP (Dollar)	OPEN
Russian	23890583	54.88083	0.761417	5880.42	6.6E+08
Azerbaijan	1120500	54.78583	0.714417	2309.75	1380576
Iran	2556500	49.26417	0.707417	3144.121	5.8E+10
Kazakhstan	3526667	50.98917	0.742	4354.613	4.62E+08
Turkmenistan	9500.000	45.04583	0.682083	3971.203	2746804
Mean	6220750	50.47317	0.721467	3552.713	1.18E+10
Median	2174500	51.08000	0.730500	3129.261	4.75E+08
Maximum	30792000	55.70000	0.778000	6923.493	6.90E+10
Minimum	6000.000	44.92000	0.668000	1046.421	1221795
Std. Dev.	9093547	3.440842	0.033967	1569.289	2.36E+10

It is discernible in Table 3 that on average, countries with the greatest number of tourists have experienced the least quality of the environment. Nevertheless, by having a federal plan titled "the development of domestic and inbound tourism", Russia has witnessed the highest number of tourists and the highest indices of environmental performance, human development, and income per capita.
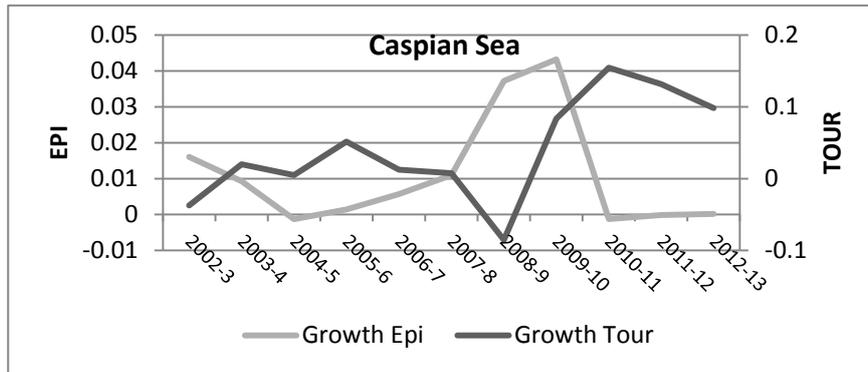
Figure 1. Development of Tourism and Environmental Performance Index for the Caspian Sea Nations During 2002-2013

The intuitive relationship between growth in tourism and growth in environmental performance index has been illustrated in Figure 1. According to this figure, growth in tourism index of countries investigated in the study is not congruent with their environmental performance index. Although no clear and particularly significant relationship could be observed between tourism and environmental performance index in these countries, careful examination of the research hypotheses requires the evaluation of the research model (conducted in the next section).

4. Empirical Results

In order to start estimating the models, first it is necessary to examine the stationarity of all variables in the model of panel data. Non-stationarity of variables, whether in time-series or in panel data, would result in problems such as spurious regression. Findings of the unit root test obtained by the application of LLC method are presented in Table 3. According to Baltagi (2005), LLC test has a comparative advantage in limited time-series data over other similar methods with regard to examining the stationarity of panel data.

Table 4. Unit Root Tests Using the LLC Method

Variable	Test Statistics	P-Value
TOUR	-2.093	0.018
EPI	-9.253	0.000
HDI	-2.088	0.018

Variable	Test Statistics	P-Value
GDP	-3.002	0.001
GDP2	-1.721	0.043
OPEN	-2.432	0.007

Source: Authors' calculations

According to Table 4, P values have been estimated less than 5 percent. Therefore, null hypothesis of the study (stating that a unit root exists for the variables) is rejected and all the variables considered in the study are stationary according to LLC test (I(0)).

After the stationarity of the variables is confirmed, Panel VAR has been estimated for The Caspian Sea nations. In addition, dynamic mutual influences resulting from the created shocks have been studied by the application of impulse response functions and the variance decomposition. In the variance decomposition, the share of shocked imposed against the various variables within the model is specified in the forecast error variance of a variable. The impulse response function shows the dynamic behavior of variables in the time of imposing a shock equal to one standard deviation. In addition, by the use of impulse response functions, dynamic response of the model against the shock imposed from each one of the variables could be calculated. By applying a program designed by Love and Zicchino (2006) in Stata, the auto-regression model of panels has been estimated through the application of fixed effect. Impulse response functions for the Caspian Sea nations have been shown in Figure 2.
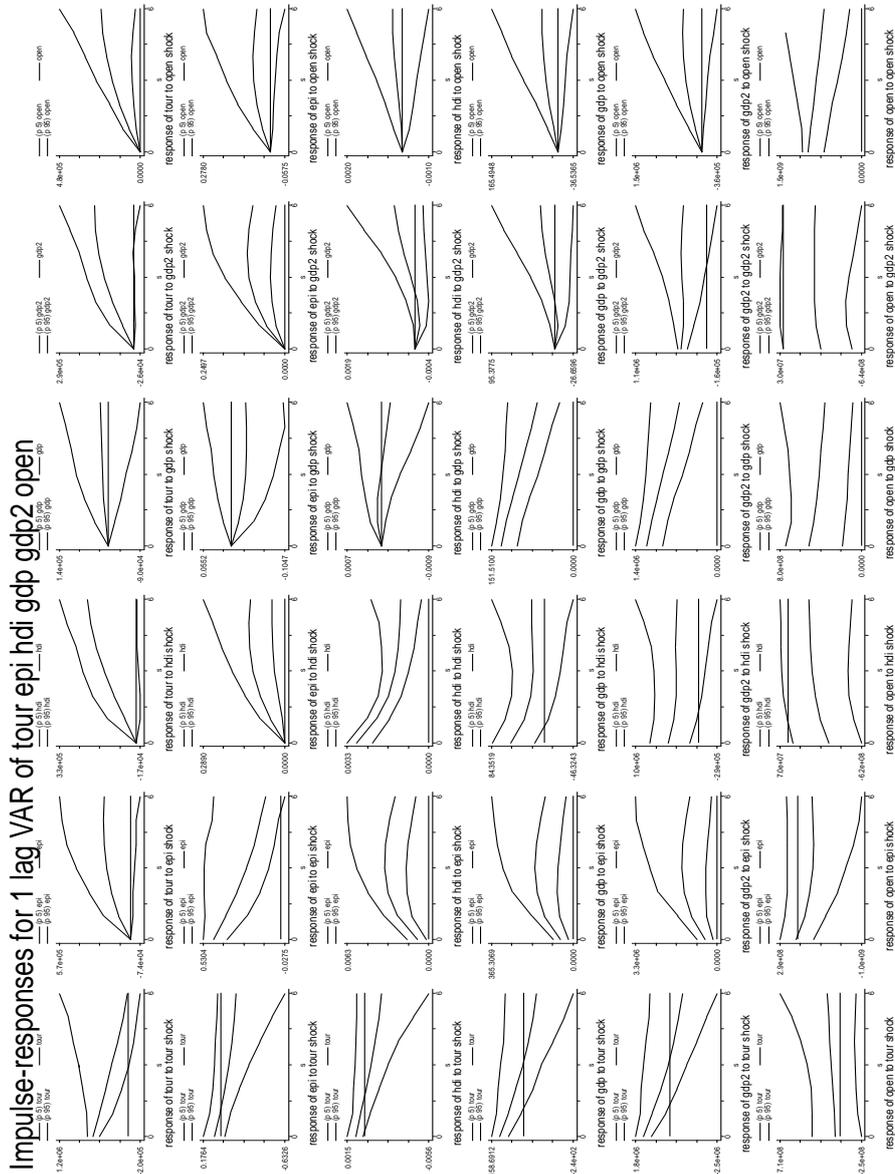
Figure 2. Impulse Response Functions for the Caspian Sea Nations
Source: Authors' calculations

From the Figure 2, it could be concluded that the tourism has a positive reaction toward environment in the Caspian Sea countries, this

positive reaction indicates that the higher the quality of environment within a country, the more it would be attractive for the tourists and this would result in more developed tourism industry. This finding for the case of the Caspian Sea nations is in line with findings of Urry (1995), Laws (1991), and Holden (2007) on the positive impact of environmental performance on tourism. Specifically, tourists desire to be in a clean nature and environment. Therefore, it could be predicted that environments of higher quality would bring about the tourism industry expansion.

The reaction of tourism to human development index was found to be positive; in a way that the higher the level of human development in a country, the more tourists could be attracted. The literature in the field confirms the positive impact of human development index on tourism (e.g., Mehrgan et al., 2012; Musai et al., 2011). The reaction of tourism to the impulses arising from gross domestic product per capita was found to be positive, too; this has been confirmed in studies conducted by Katircioglu (2009), Payne and Mervar (2010), Cortés-Jiménez et al. (2011), and Bouzahzah and Menyari (2013). This means that gross domestic product has been able to act as a force in the development of tourism and instigate the development of other service sections through the development of facilities and infrastructure. Figure 2 shows that the reaction of tourism against trade openness within the Caspian Sea countries is positive. This means that trade openness could potentially cause the arrival of a flow of international tourists through the business of travel (an integral part of tourism), reduction in prices, improvement in quality, and the creation of variety in products. The positive impact of trade openness on tourism is in line with studies performed by Summers and Heston (1991), Dwyer et al. (2000), and Gooroochurn and Sugiyarto (2004). Results with regard to the negative impacts of tourism on environmental performance are in line with studies such as Laws (1991), Goudie and Viles (1997). Specifically, in the Caspian Sea nations, tourism has had negative impacts on the environment because of such reasons as the lack of a comprehensive and agreed-upon legal regime, lack of serious determination with regard to the environmental issues, addressing private matters instead of public ones, lack of environmental awareness, and improper management of resources. Therefore, the environment would face serious damages without proper planning for tourism (e.g. dumping waste related to the development of tourism). As

the Helsingborg statement on sustainable tourism (2007) indicates, unplanned and uncontrolled tourism lead to the destruction of tourism (Gössling et al., 2008). It is further mentioned that the key goal in planning for tourism is the control over models of physical development and protection of environmental resources.

The reaction of tourism to human development index was found to be positive; since education and awareness are two of the major indicators of human development, significant improvement in public awareness regarding the consequences of environmental damages could enhance the improvement of environmental performance index. As could be seen in the Caspian Sea nations, the reaction of environmental performance index to GDP per capita (as a criterion to indicate economic growth) is negative, while this reaction to the square of GDP per capita is positive. For this reason, in its initial steps towards development, an economy makes huge uses of environmental privileges; consequently, increase in production leads to the deterioration of environmental performance index. However, after a proper level of welfare has been attained, environmental products turn into luxuries because of being scarce and increase in income per capita. Therefore, the existence of a U-shaped Kuznets environmental curve between GDP per capita and environmental performance is confirmed. The reaction of environmental performance index to the impulses arising from the degree of trade openness in the case of the Caspian Sea nations was found to be positive since advocates of free trade believe it allows countries to specialize in the production of goods and services in which they have a relative advantage and maximize their production according to specific levels of energy and materials through the allocation and consumption of resources in a more proper way. This argument emphasized the potential of trade openness to increase financial resources accessible to protect the environment through presenting motives to enhance production capacity. The positive impact of trade openness on the environment is in line with the findings of the studies such as Munasinghe (1993), Zhang (2007), Alam et al. (2011), and Shahbaz et al. (2013).

Here, the share and relative importance of the impacts related to the impulses of a variable on changes in other variables has been estimated by the use of Variance Decompositions. Impulses within the auto-regression model, being organized by the application of Cholesky Decompositions, indicate that the variables that appear sooner would be

exogenous. Findings for the analysis of variance over the variables in the Caspian Sea nations are presented in Table 5.

Table 5. Analysis of Variance for the Selected Countries in the Caspian Sea During 2002-2013

Variables	S	TOUR	EPI	HDI	GDP	GDP2	OPEN
TOURE	10	0.470	0.151	0.133	0.002	0.069	0.174
EPI	10	0.152	0.629	0.105	0.007	0.077	0.028
HDI	10	0.135	0.231	0.611	0.002	0.016	0.005
GDP	10	0.154	0.269	0.0212	0.518	0.007	0.030
GDP2	10	0.212	0.044	0.045	0.242	0. 419	0.038
OPEN	10	0. 018	0. 043	0.049	0. 167	0.071	0. 650
TOUR	20	0. 470	0. 140	0.139	0. 002	0.063	0. 183
EPI	20	0. 204	0.565	0.103	0. 009	0.072	0. 046
HDI	20	0.216	0.204	0.527	0.008	0.018	0.026
GDP	20	0. 209	0. 249	0.031	0.463	0.012	0. 035
GDP2	20	0.271	0.043	0.053	0.220	0. 367	0.045
OPEN	20	0. 031	0. 037	0.043	0. 163	0.074	0.650
TOURE	30	0.466	0. 140	0.142	0. 002	0.066	0. 182
EPI	30	0.203	0.551	0.103	0. 011	0.070	0. 062
HDI	30	0.210	0.200	0.510	0.011	0.018	0.053
GDP	30	0. 210	0. 239	0.043	0.450	0.015	0. 043
GDP2	30	0.270	0.054	0.065	0.210	0.355	0.056
OPEN	30	0.031	0. 034	0.040	0. 162	0.072	0.661

Source: Authors' calculations

According to the Table 5, it could be observed that in the long-term period (10 years), the highest share of fluctuations in the tourism sector could be accounted for by the shocks arising from the tourism itself, while shocks arising from the index of trade openness are in the second place in this regard. In other words, the second most important influence on tourism comes from trade openness index. In addition, findings in Table 5 indicate that, in the long-term basis, the majority of the

fluctuations in environmental performance index could be accounted for by shocks in the variable itself. Next to that, the highest share of environmental performance index could be accounted for by tourism. Thus, environment in the Caspian Sea region is influenced a lot by tourism, in a way that the rapid and unplanned development in tourism sector causes severe degradation in the environment. Therefore, lack of proper planning, mismanagement of tourism activities, and lack of environmental awareness lead to the destruction of environment in the region. Findings presented in Table 5 for the second and third 10-year periods show a similar trend. Therefore, with regard to the impulse response functions and the analysis of variance, the first and the second hypotheses in the study (the positive reaction of tourism toward the environment and the negative reaction of environmental performance index to tourism in the Caspian Sea nations) are confirmed.

5. Conclusion

The current study aimed at investigating the relationship between tourism and environment performance. For this purpose, five the Caspian Sea nations were considered for investigation during 2002-2013 and were studied by the application of vector auto-regressive model in the form of panel data. Then, hypotheses 1 and 2, related to the positive reaction of tourism toward environmental performance and the negative reaction of environment toward tourism were examined.

According to the obtained results, the reaction of tourism and environment to human development index was found to be positive. Thus, countries can develop their tourism industry and heighten the quality of their environment through the enhancement of human development index as an indicator of development (of any kind) in human affairs. The effect of GDP per capita and its square on tourism was found to be positive. Thus, tourism industry could be assisted through the application of GDP per capita as a criterion of economic growth. The negative impact of GDP per capita and the positive impact of its square on the environmental performance in the Caspian Sea nations indicate that in the initial stages of production, increased production has led to the deterioration of environmental performance because of low awareness with regard to environmental problems and lack of access to environment-friendly technologies. However, after a certain level of production was achieved, countries have enhanced the

status of the environment through executing environmental policies in order to support green technologies.

Thus, Kuznets's environmental hypothesis regarding the presence of a U-shaped relationship between the environmental performance index and income product per capita is confirmed. In addition, the reaction of tourism and environmental performance index to the degree of trade openness was found to be positive. In this regard, the countries investigated in this study could enhance their tourism industry and the quality of environment through establishing trade openness policies. In addition, the reaction of tourism to environmental performance was found to be positive, while the reaction of environmental performance in the Caspian Sea nations to tourism was found to be negative. Nonetheless, the approach taken by the World Tourism Organization puts emphasis on the maintenance of environmental diversity and integrity, fulfillment of basic human needs, protection of resources to be used by future generations, and reduction of injustices. If sustainable development is one of the objective goals in the current era of tourism, it is of great importance, then, to evaluate the economic, cultural, and environmental performances and impacts of tourism in tourism destinations. Nevertheless, no comprehensive study has been conducted on the relationship between tourism and environment and no ecotourism management has been implemented, consequently. Within the framework of the findings of this study, it is suggested that regional environmental policies be taken into special consideration as plans for the development of physical attractions are designed and executed.

Endnotes

1. www.ngdir.ir
2. The names of the selected countries are presented in the Appendix1.
3. World Travel and Tourism Council (WTTC)
4. All values are in constant 2014 prices and exchange rates
5. No figures have been mentioned for Turkmenistan and Tajikistan in the report.
6. United Nations Development Program (UNDP)

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:Appendix

List of the Caspian Sea nations: Azerbaijan, Iran, Kazakhstan, Turkmenistan and Russia.