The tourism industry in Iran's foreign exchange earnings forecast using artificial neural network

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Abstract

The main purpose of this paper to predict the foreign exchange income of tourism industry in Iran. Therefore, in the first stage of the factors affecting the tourism industry in Iran and the model taking into account factors such as world price index of domestic price index, the number of hotels, investments made, in training workers in the tourism sector and global GDP is stipulated. Then, using artificial neural network and data years (2009-1985), the model estimates, And considering the constant coefficient estimates, foreign exchange income of tourism industry for 10 years is predicted. The results indicate that neural prediction method is the trend of tourism foreign exchange earnings. Next, to assess the economic effects of foreign exchange income of tourism industry on the macroeconomic variables of the model structure Explain its operation vector (SVAR) and long-term restrictions Blanchard - go out over IM is used. The results show that a shock in order to increase foreign exchange earnings from tourism, Increased foreign investment and economic growth in the long term effect and reduces unemployment. But inflation has little effect.

Keyword: tourism, foreign exchange earnings, artificial neural networks, pattern extraction Explain its operation Structural

1. Introduction

Tourism root is deep in human history, but with a modern and contemporary influences, and come the new phenomenon of modern industrial civilization is brilliant, Aspects of life that many countries, communities and individuals affected have been, So in the last fifty years, the man has become one of the most important phenomena, Phenomenon with significant influence on human societies, has transformed the geographical landscapes.

Now the tourism industry as one of the largest and most diverse parts of the world and propelled is the world economy.[1]

Now the tourism industry as one of the largest and most diverse parts of the world and propelled is the world economy. The rapid growth of this industry plays an important role in changing social, economic and environmental conditions around the world has, So many countries as the largest and most diverse tourism industry and the main source of income, employment, private sector growth and development of infrastructure as, Using this approach, his condition improved to a remarkable, And economic problems such as low per capita income, unemployment and shortages of foreign exchange earnings were overcome.[2]

Especially in developing countries, which means that other economic activities such as manufacturing or mining are economically efficient? Very important role in the business or not, Much attention has been to develop the tourism industry. However, the increase or decrease a country's share of global tourism revenue, depending on the factors and variables, According to the country, administrative issues and the level statistics and information can be different. In between Iran and the single product with the features of per capita income is low, despite the many benefits of diversity, climate, attractions Natural, and history and ancient civilization, ancient and religious monuments, architecture, handicrafts, culture and geography.

Tourism Industry and Expands It is so underdeveloped and Iran share of world tourism is very Negligible, And serious injuries on the bodies of the passer is the country's economy, Thus, the tourism industry through the identification of factors that influence how thoroughly and also on other economic variables can For pioneering many of the country's economic problems. This paper therefore seeks, factors affecting international[3] tourism revenues and the effectiveness of each of the factors specified by the regression model, And strategies for increasing foreign exchange earnings based on the expression is of these factors.

2. Theoretical

2-1. Tourism industry

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[1] Mahalati, S. (1380) Introduction to Tourism, Printing and Publishing Center, Shahid Beheshti University
[2] Mousayi, M, (1383) "Estimation of tourism demand to Iran," Journal of Business Research, No. 32, p. 244-225
[3] *International Tourism*

Tourism industry that economists it "invisible exports" also known as, Today, as one of the most important industries in the world, the industry is growing Finder, In recent years than other sectors of the economy expanded rapidly And creating new job opportunities could act as an industry leader. According to statistics released by the World Tourism Organization, International tourism revenues from oil, petroleum products, vehicles, parts and spare parts to the highest level has of world exports. According to World Tourism Organization (UNWTO)[4] in 2004 the number of 760 million foreign tourists traveled to the Middle East countries. According to foreign tourists Europe four percent, seven percent in Africa, in America, ten percent and twenty-nine percent of Asian countries has increased.[5] According to official forecasts of inbound tourists in the world will be of 2020 to 5 / 1 billion people. Tourism as the most important items in the 49 countries now developed Export, In 39 countries as the first product is Export.

General vocabulary Tourism (Tourism) Tour of the word taken to mean navigation Turns the Latin root word meaning to get around, round-trip between origin and destination, The Greek, Spanish and French and Finally in English. What about the word tourism is largely accepted, this term is Extent and unstructured. The United Nations Statistical of (1993)[6] Tourism, including the activities of people such as including travel to places outside their usual environment and staying there is for less than a year for leisure, business and the other.[7] Tourism has three main features include[8]:

1. In most cases, before the service cannot be seen or tested. This means that the test is done after the purchase.
2. To serve in the place of purchase and consumption are not transferable and displacement.
3. People and places of service are part of the service. So tourism is included in many sectors of society.

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4 The United NationsWorld Tourism Organization

[5] Department of Planning and Economic Affairs, Ministry of Commerce (1388), "Evaluation of the tourism industry in Iran and the Islamic countries
6 *United Nations Statistical Commission, 1993*

7 *World Travel & Tourism Council (WTTC), 2002*

[8] Komil. Tayebi et al (1386)

These three characteristics are the People, who live and work in a particular place, just do not produce goods and services, but many of them, are part of the goods and services produced. Tourism can be based on several factors such as time, place, nationality, incentive travel, and organizing the trip and the division etc . But it can into two divided.

- Tourism, leisure (recreation, sports, religious, health needs, mental, or physical education, etc)
- Business tourism (travel, business, issues relating to cooperation, coordination, or the conclusion of agreements on economic, cultural, technical and technological, etc)

2-2. the economic impact of tourism

The experts and entrepreneurs, building up the tourism development, Means that it will lead to economic development; but its potential as a tourist, corporate and institutional development is affected by structural factors. Figure 1 shows the relationship between double and tourism industry.

Given that tourism is classified in service industries, Revenues in the Impure Production Internal

(GDP) of the host country, and directly affects economic growth. The direct entry of international tourism on the national economy, and demand cash injections from foreign sources. this increase in tourism and increase revenue so as to increase the export of works. Its special feature is that many non-tradable goods in the international Turns into tradable goods. In general, three direct tourism on the national economy is more recognizable.[9]

1. Increase the domestic price level
2. Increase the supply of goods and services
3. Improving the balance of payments

With the arrival of tourists to a region or country, region or country has increased the demand for goods and short-term price level will increase as a result of this increased demand. This effect is particularly pronounced when the region or country of origin generally have a higher income

[9] *Tiago Naves Sequeira and Carla Campos (2005)," International Tourism and Economic Growth: a Panel Data Approach", Natural Resources Management (NRM), NOTA DI LAVORO141.*

level than the destination. Also due to the effects of overflow[10] and external works[11] Interaction with other economic sectors in the tourism industry, will indirectly lead to economic development. With the growth of each of the factors such as economic development, transport, development ICT , the development of tourism facilities and infrastructure can be found growing tourism industry.

Assessing the economic impact of tourism because tourism development is to provide information necessary for the formation of policies. The policies that determine a country's entire infrastructure needed to achieve the most appropriate type of tourism is in production. Despite all these issues, economic impact analysis of tourism in the global economy is vital. This industry is part of that number is over 100 million employees to work and positive effect on employment and development. The number of positive and negative effects on tourism, according to the nature of their cultural environment - social, economic, natural and leave Iran. Since the development of small tourism and foreign tourists visit Iran often has similar cultures, Social effects - so far has been limited in their culture. But contrast, a significant adverse effect on the huge domestic tourist places of cultural and natural heritage left And various is forms of degradation and devaluation of Attraction. In terms of economy, tourism's share in GDP of 3/4 percent, the direct and indirect employment for about 541,000 jobs in non-oil exports are estimated at about 14 percent. This reflects the general weakness of this sector in terms of management, advertising, legal structure and its poor relations with the country's industrial structure.

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10 .*Spillovers*

11 *Externalities*

| development of recreation and welfare facilities | development of public health | places of residence-restaurants and hotels | development of ICT and e-money | development of transport routes |

development of tourism infrastructure facilities

Tourism

Economic Development

The economic boom in various activities

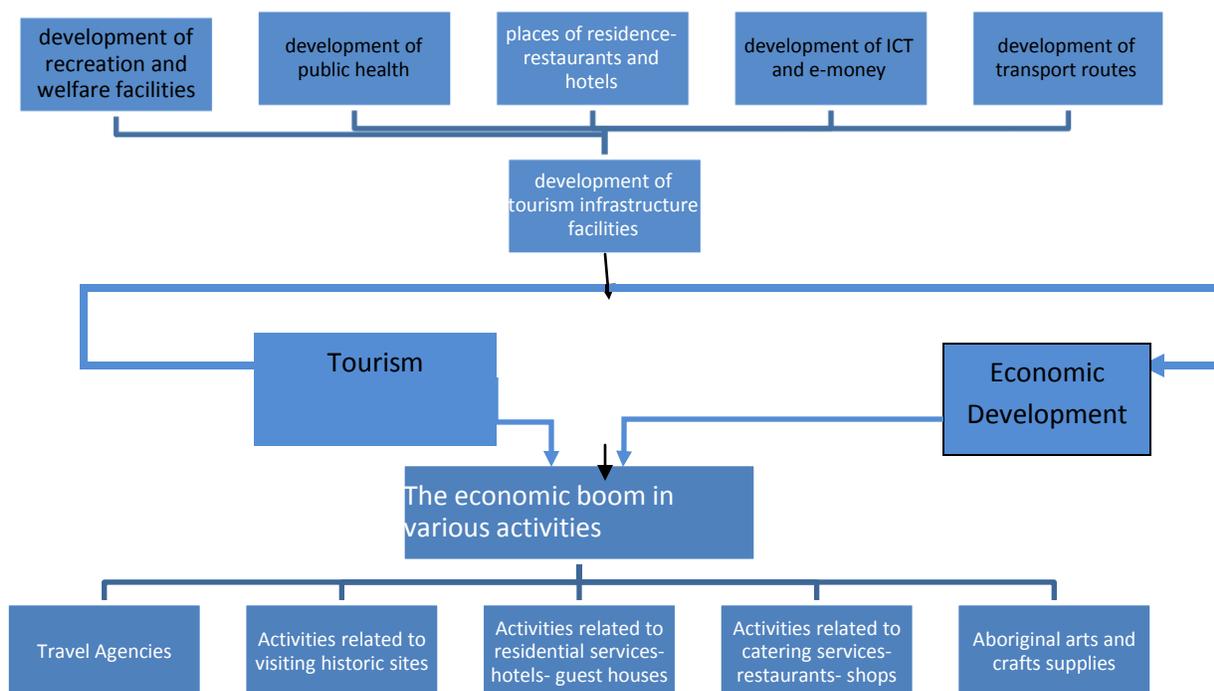| Travel Agencies | Activities related to visiting historic sites | Activities related to residential services-hotels- guest houses | Activities related to catering services-restaurants- shops | Aboriginal arts and crafts supplies |

Figure 1: the relationship between tourism and economic development

3- Status of the tourism industry in Iran

Status of the tourism industry in Iran has indicated Iran, the country's tourism sector in terms of GDP ranking 86th among 174 countries and in third place after the Persian Gulf states of Bahrain and Qatar account And investment in the tourism industry, ranking 172 among 174 countries in the Middle East in the final ranking. The value of tourism in 2005 Iran ranks 43 among 174 countries has been achieved. Iran must comply with the 20-year vision in all fields of economic, social and cultural level of 1/5 percent and 2 percent of total tourism revenues worldwide tourist and business area of the first rank. [12] .Table (1) of the foreign tourists visited Iran during the years 1348-1385 shows. Chart based on the trend of foreign tourists visiting Iran was divided into three distinct phases. The first stage corresponds to the years 1348 to 1356, during this stage of its development programs and efforts to expand infrastructure, And residential facilities and

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[12] Department of Planning and Economic Affairs, Ministry of Commerce (1388), "Evaluation of the tourism industry in Iran and the Islamic countries'

the expansion of Iran's international relations with foreign countries and have a positive effect was on the tourism industry The number of foreign tourists arriving in Iran with a 65/22 percent growth from 341,198 people in 1348 to 678,157 in 1356 to increase. The second phase began with the Islamic revolution and imposed war (1357-1367). In this period due to lack of sufficient sense of security, the number of foreign tourists decreased, And 678,157 people in 1356 to 70,740 cases in 1367 decreased. At this stage, 8% average annual tourism industry has experienced negative growth. With the end of the war and start the first program of reconstruction and development, Iran's tourism industry was entering its third phase. At this stage, with partial restoration of relative security and economy, the number of foreign tourist visitor to the trend of Iran. As of 1367, with growth to 70,740 people, equivalent to 163/7 percent increase in 1385 to 2,735,000 people.

Table (1) the estimated revenue from foreign tourists and foreign exchange rate and annual percentage changes are shown. According to the table, the foreign exchange earnings from foreign tourists visited Iran in 1348 was about 43 million dollars that figure to 235 million dollars a year Increased foreign exchange earnings in 1357 but started the second sharply decreased. With a few renovations, the amount of $ 30 million in 1377 was negligible. However, entering the third stage, the foreign exchange earnings, and its trend in 1385 totaled 1,368 million dollars.

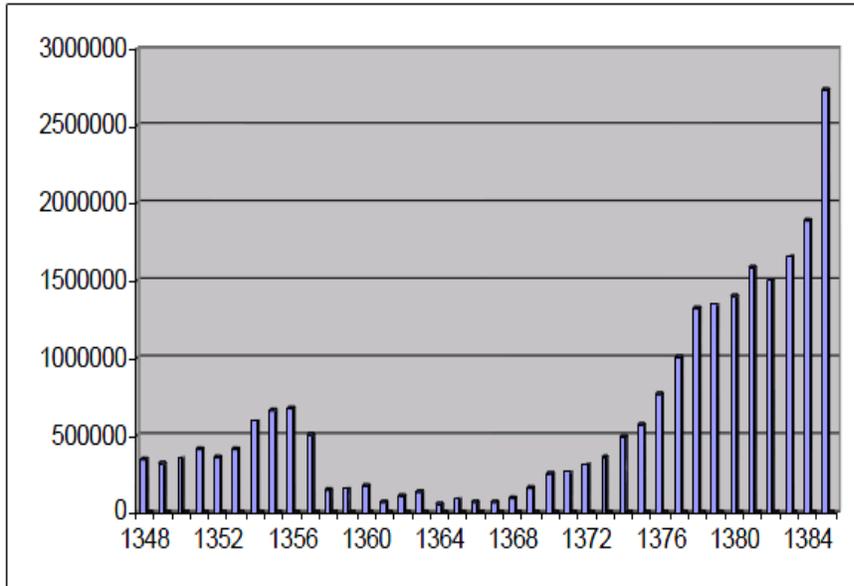Graphs (1) the foreign tourists to Iran during 1348-85

Table 1: The foreign exchange earnings from foreign tourists to Iran during 85-1348

Percent change	The changes	Foreign exchange earnings (million dollars	Year	Percent change	The changes	Foreign exchange earnings (million dollars)	year
7.1%	2	30	1367	-	-	43	1348
30.0%	9	39	1368	20.9%	9	52	1349
66.7%	26	65	1369	11.5%	6	58	1350
61.5%	40	105	1370	13.8%	8	66	1351
15.2%	16	121	1371	-16.7%	-11	55	1352
8.3%	10	131	1372	47.3%	26	81	1353
18.3%	24	155	1373	95.1%	77	158	1354
32.3%	50	205	1374	9.5%	15	173	1355

27.3%	56	261	1375	1.7%	3	176	1356
34.9%	91	352	1376	33.5%	59	235	1357
25.3%	89	441	1377	-72.8%	-171	64	1358
1229.9%	5424	5865	1378	-3.1%	-2	62	1359
-88.6%	-5194	671	1379	16.1%	10	72	1360
4.5%	30	701	1380	-62.5%	-45	27	1361
13.0%	91	792	1381	55.6%	15	42	1362
-5.3%	-42	750	1382	-16.7%	-7	35	1363
10.7%	80	830	1383	-8.6%	-3	32	1364
13.9%	115	945	1384	-9.4%	-3	29	1365
44.8%	423	1368	1385	-3.4%	-1	28	1366

Source: Travelling and Tourism, Office of Statistics and Economic Studies and Marketing

3. A review of experimental studies

A review of experimental studies conducted in Iran indicate that the field of tourism most studies of the economic importance of tourism, principles and guidelines for tourism, tourism planning, tourism And economic development, tourism issues, sociology, geography and relationship issues in tourism development, tourism conditions in Iran compared with other countries, and national development and mass tourism, and tourism is limited. These studies are often descriptive and have not provided a model for estimating functions of tourism demand or supply, if the economy is tourism-related studies in other countries is vast. but the main purpose of this paper to investigate the factors affecting tourism foreign exchange revenues from tourism demand patterns and clear Macro variables that affect the tourism industry, economic studies conducted in the area around the base of the internal and external causes.

First Division: supply and demand factors affecting the tourism industry

Aykuz and others (1998)[13] Factors affecting demand for tourism to Turkey (10 countries Non-residence tourists entering the country in Turkey)[14] during the period (93-1982) paid. The results

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[13] *Icoz, O., T .Var, and Kozak, M. (1998), "Tourism demand in Turkey", Annals of Tourism Research, Vol 25, No1, pp 236-240*

of the estimated model log - log shows, Variable index of consumer prices and exchange rates in Turkey are the factors affecting demand for tourism. Ad and Sayaymn (2001)[15] using panel data and cross-sectional study of factors affecting the tourist's inflow to 43 African countries during the period (2002-1996) began. Estimation model based on cross-sectional results show that, using the internet and urbanization rates in Africa has an important role in tourism. While the number of available hotels and tourism infrastructure in the most effective way to attract tourists to this country panel data is considered. Wash (2003)[16], Tourism Ireland's request to investigate the origin of the four countries, including Britain, America, France and Germany has paid. Estimation results indicate that per capita income the actual country of origin, the price index for domestic goods and services to countries of origin of goods and services price index, exchange rates, turmoil in Northern Ireland and the oil crisis of 1973 and 1979 as variables affecting demand are Tourism Ireland. Song and others (2003)[17] Factors affecting international tourism demand in Hong Kong and the amount of demand using panel data of 16 countries during the period of time (2001-8) and the method of exponential[18] smoothing forecasts. and concluded that changing relative prices and real income is the most effective agent honking on tourism demand. Furthermore, the results indicate the anticipated rapid growth in tourism demand in Hong Kong is required. Katafuno and Gander (2004)[19] using error correction model to examine factors affecting the demand for Fiji tourism began. Estimation results show, the main business income countries, Fiji and the Fiji turmoil are important factors influencing tourism demand. Haleshglo (2008)[20] to study the tourism offer (out of Turkish nationals to visit other countries), Turkey[21],

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[14] . *Inbound tourism*

[15] *Naudé, W.A. & Saayman, A. (2001), "The Determinats of Tourists Arrivals in Africa: a Panel Data Regression Analysis", North-West University, Potchefstroom Campus, Private Bag X 6001, Potchefstroom 2520.*

[16] *Walsh, Mary (2003),"Demand Analysis Irish Tourism " Journal of the Statistical and Social Inquiry Society of Ireland Vol. XXVII, Part IV*

[17] *Song, Haiyan, Wong ,Kevin K. F. and Chon ,Kaye K. S. (2003)" Modelling and forecasting the demand for Hong Kong tourism",International Journal of Hospitality Management Volume22 ,Issue 4, pp 435-451.*

[18] *Exponential Smooth*

[19] . *Katafono, R& Gounder, A. (2004)," Modeling Tourism Demand in Fiji ", Economics Department Reserve Bank of Fiji.*

[20] *Halicioglu ,Ferda(2008), "An Econometric Analysis of Aggregate Outbound Tourism Demand of Turkey", Tourism Management, Vol 25, No 5, pp 565-580.*

[21] . *Outbound tourism*

using time series data (1970-2005) paid And concluded that real income and relative prices are the most effective factors in this field.

The second category: the impact on the tourism industry on economic variables

Balagvyr and Kantavla (2002)[22] in a study to test the role of tourism in the long-term economic growth and causality tests in Spain have the same mass. His order to study the relationship between tourism and economic growth, a model that includes real GDP, real exchange rate of absorption and tourism is estimated to have about and quarterly data for this study (1975-97) have used And Research results show that economic growth in Spain in the past three decades, international tourism has led to tangible sustainable development. Bryda and colleagues (2008)[23] in an article on the impact of tourism on economic growth in Mexico have studied in this study the relationship between tourism expenditure, real exchange rates and economic growth using quarterly data and the accumulation of test Johansson - Juosiliyos estimated. The results show that the shock occurred in travel expenses is resulting in a decline in economic growth but in the long-term positive impact on economic growth in Mexico. Bunang and Wan Chen (2008) in a study to examine the relationship between tourism and economic growth, using annual data from 2005 to 1995 in 88 countries have paid. Them in their investigation of a nonlinear model is used to express this relationship Estimation results show that a positive and meaningful relationship there between tourism development and economic growth. In Iran Mahdavi (1381)[24] also investigated the role of tourism in rural areas surrounding cities and strategic model is presented, The results showed that people of vision, of a total of 29 indicators, 16 indicators of the impact of tourism on economic, social, cultural, environmental and been approved And the authorities' view, the development of this industry, 18 of 29 indicators of economic, social, and cultural environment is confirmed. Ms. Lofty to the development of tourism as a strategy for exiting the crisis is unemployment. He uses practical examples to prove that other countries, Tourism industry due to their having particular properties of the unemployment problem will mostly go away.

22 *Balaguer. J and Cantavella-Jorda. M, (2002), "Tourism as a long-run economic growth factor: The Spanish case", Applied Economics 34, pp.877–884.*

23 *. Brida. Juan Gabriel, Edgar. J. Sanchez Carrera and W.Adrian Risso,(2008), Tourism's Impact on Long-Run Mexican Economic Growth",Economic Bulletin, Vol. 3, No.21 pp. 1-8.*

[24] Mahdavi, M. (1381) investigated the relationship between tourism expansion and economic development in rural areas, social, cultural and environmental MSc thesis University

4. Experimental model

In this section we introduce and estimate the demand function of tourism in Iran and to evaluate the impact of variables affecting tourism demand, we are in Iran. The overall shape of the demand for tourism in this study is as follows:

1- $IT = F(HOT, WGDP, IL, PR)$

Variables in the model (1) are: IT: Iran's foreign exchange income from foreign tourists arrival in terms of dollars, PR: Index of domestic prices to world price indices and indicators of economic conditions in Iran: HOT: The number of hotels built in Iran annually and represents the state of infrastructure in the tourism industry, IL: Investment made in training workers in the tourism sector and WGDP Global GDP.

First, the estimated model (1), the reliability of test variables Dicker - Fuller generalized the results of the test in Table 1 have been made.

Table 1 - Unit root test variables during the study period (1985-2010)

First-order differencing		Variable level		
Critical	Statistics	Critical	Statistics	Variable
-٢/٩٧	-٧/٠٢	-٢/٩٧	-٢/٥٨	IT
-٢/٩٧	-٥/٤٦	-٢/٩٧	٠/٥٣	GDPW
-٢/٩٧	-٥/١٤	-٢/٩٧	-١/٣٨	IH
-٢/٩٧	-٣/٦١	-٢/٩٧	-١/٨١	IL
-٢/٩٧	-٥/١٥	-٢/٩٧	٠/٤١	HOT
-٢/٩٧	-٥/٦٩	-٢/٩٧	٤/٧٢	PR

Source: Research findings

According to the results of Table 1, all data are collected depending on the degree once the differencing is reliable. So, without fear of creating a false regression model using the ordinary least squares method and period (1985-2010) was estimated. The results of estimating equation (2).

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$$IT = 44.23 + 0.31HOT + 0.26WGDP + 0.09IL - 0.51PR$$

$\quad$ (2.1) $\quad$ (1.96) $\qquad$ (3.6) $\qquad$ (1.01) $\quad$ (-4.13)

$R^2 = 0.95 \quad D.W = 2.01$

As can be seen, all coefficients except the significant investment of human resources and their signs are consistent with theoretical expectations. Iran's foreign exchange earnings so that the tourism industry with increased global production and increase the number of hotels And with domestic prices relative to foreign prices and thus increase the cost of travel to Iran, is reduced The estimated coefficient indicates the explanatory power of the model.

5. Anticipated revenues from the tourism industry using linear and nonlinear

Economists predict that the years of economic variables using linear models. So, the most common and easiest way to estimate these models is using ordinary least squares (OLS). Although, linear models are useful in the analysis of economic behavior and policy outcomes, but cannot offer them to provide an overall picture of the prevailing economic system was adequate. While the majority of the world's economic systems affected by many variables such as non-economic factors, psychological, social, political, and physical, are non-linear behavior of its exhibit, The use of econometric methods in the application of common standards and methods such as linear OLS estimation and prediction of these variables are insufficient And in some cases false and misleading results can be followed. Thus, in recent years, significant advances in information processing by computers and software applications to drive research and application of nonlinear models have increased dramatically. One of the most famous models in the field of artificial neural networks, which recently entered the realm of economics and the economic variables used for prediction. Neural network models using mathematical functions and processors to pay a simulated human brain function and are able to model the nonlinear relationships of unknown severity. With modeling through artificial neural networks, model makers, other than they are to function as a driving function in the hidden layer and output layer is able to simulate any nonlinear function and thereby reduce the amount of error in estimating the parameters and Result in more accurate predictions can be made. Accordingly, in this paper, foreign exchange earnings from tourism industry of Iran, in addition to the linear method (OLS), using artificial neural network is also expected that more will be explained.

1) Using OLS

In order to predict the foreign exchange earnings from tourism using linear output sample, the variables in the model to predict the future in the past 10 years. Then consider fixed coefficient estimate model (2) and inserting the values of each variable, foreign exchange revenues in dollars for 10 years is expected to table (2).

2) Using Artificial Neural Network

It is notable, with one hidden layer neural network model, a nonlinear function of stimulus, a sufficient number of neurons in the hidden layer and output layer is a linear function of stimulus is able to approximate any nonlinear function calls. Thus, according to the foreign exchange income from tourism is an effective combination of several factors, , To achieve a model structure and optimizing the performance and accuracy of a few model inputs - one output is used (Khaluzadeh soil and Sadiq, 1382). Neural network used in this part of the 3 layers (input layer, hidden layer and output layer) is formed. Three input neurons layer, middle layer of three neurons and an output layer neurons and linear actuators tangent sigmoid functions in the hidden layer and output layer[25] linear function was used. The input to the network, the calculation is performed prior to the publication output of the neural network model to be obtained; the law of error propagation, error between the desired output value is calculated, the relationships existing between the layers of the publication will be distributed Weight each of these components is one of the years that must be anticipated. Matrices and bias vectors were then corrected and the output vector has several components, is obtained. Approximately 85% of the time series data set is allocated. After the network is trained with this data set, it will be added to the test set (those not using the information in the learning network), Then calculate the average network error and network parameters that have the lowest average prediction error is used to store. ` Results of prediction using neural networks in Table 2 are given.

Table (2) predictive values of foreign exchange earnings by using regression and neural network two years (2010-2019)

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[25] *Purelin*

Foreign exchange earnings (in terms of millions dollars)		Year
Artificial Neural Network	OLS method	
٩٧٨	٨١٥	٢٠١٠
٩٨٦	٧٦٥	٢٠١١
٩٩٥	٨٣٥	٢٠١٢
١٠٠٦	٨٥٦	٢٠١٣
١١٢٥	١٠٠٧	٢٠١٤
١٣٢١	٩٣٢	٢٠١٥
١٤٥٦	١١٧٥	٢٠١٦
١٤٦٩	١٣٨٧	٢٠١٧
١٦٧١	١٤٢٦	٢٠١٨
٢٠١٨	١٥٢١	٢٠١٩

Source: Research Findings

As can be seen, foreign exchange earnings from tourism based on neural network approach over the next 10 years and the trend is in uniform. While foreign exchange earnings predicted using ordinary least squares and the fluctuating trend of foreign exchange earnings in some years, the increasing trend will follow.

5- The effect of tourism on economic variables

For economic variables respond to shocks in foreign exchange earnings from tourism to explain the pattern of structural imaging (SVAR) is used. In this model, in order to extract structural shocks from the VAR model of non-binding, long-term series of constraints identified by Blanchard (1989) and Blanchard and kohl over IM (1989) were presented, the VAR model is applied to non-binding.[26] Therefore, for each of the variables in the economic growth, foreign investment, unemployment, inflation and foreign exchange earnings patterns are considered as follows:

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[26] 1. Zaer, ayat. Gholami E(1386), examining the effects of fiscal policy on macroeconomic variables used to explain the approach taken, First Conference on Tax Policy and Public Finance.

$$GDP^{\circ}{}_t = B^0_{12}FI_t + B^0_{13}UNE_t + B^0_{14}PC_t + B^0_{15}IT_t +$$
$$B^1_{11}GDP^{\circ}{}_{t-1} + B^1_{12}FI_{t-1} + B^1_{13}UNE_{t-1} + B^1_{14}PC_{t-1} + B^1_{15}IT_{t-1} + \ldots\ldots\ldots\ldots$$
$$+ B^s_{11}GDP^{\circ}{}_{t-s} + B^s_{12}FI_{t-s} + B^s_{13}UNE_{t-s} + B^s_{14}PC_{t-s} + B^s IT_{15} + U^{GDP^{\circ}}_t \qquad \text{-3}$$

Equation (3) the effect of foreign exchange earnings of structural variables (IT), the unemployment rate (UNE), inflation (PC) foreign investment (FL) on the growth rate (GDP⁰) and U_t^{GDP} not the other variables in the model show the impact on economic growth. In the model $B^0_{12}, B^0_{13}, B^0_{14}, B^0_{15}$ the way of foreign exchanges earnings, unemployment, inflation and foreign investment on economic growth.

The matrix equation (3) that the VAR model is not bound by the moving average is as follows:

$$A(L)X_t = U_t \qquad (4)$$

Variables are vectors containing the rate of economic growth, foreign exchange earnings, inflation and unemployment $U_t = (U^{GDP^{\circ}}_t, U^{FI}_t, U^{UNE}_t, U^{PC}_t, U^{IT}_t)$ are correlated and non-structural mapping. For example, U_t^{GDP} is representative of shock that can affect economic growth. A(L) Matrix of the polynomial that is interrupted by the operator. Multiplying the equation (4) $A(L)^{(-1)} = B(L)$ in the SVAR model is summarized below will be achieved.

$$X_t = B(L)U_t \qquad (5)$$

The model summarized *SVAR* in matrix form is written as follows

$$\begin{bmatrix} \Delta GDP^{\circ}{}_t \\ \Delta FI_t \\ \Delta UEM_t \\ \Delta PC_t \\ \Delta IT_t \end{bmatrix} = B(L) \begin{bmatrix} U^{GDP^{\circ}}_t \\ U^{FI}_t \\ U^{UNE}_t \\ U^{PC}_t \\ U^{IT}_t \end{bmatrix} \qquad (6)$$

Where the symmetric matrices B $k \times k$ [27] that must be estimated. The only restriction $k(k+1)/2$ is needed. Therefore, to identify structural shocks from the VAR, 10 limits of detection are required. These are limits:

1 - Tourism foreign exchange earnings momentum for a lasting not effect on economic growth,

2-- An unemployment rate of shocks on economic growth is not sustainable;

3 - The unemployment rate shocks a lasting impact on the tourism industry does not have foreign currency revenues;

4-Foreign investment on economic growth has a lasting effect

5 - Foreign investment in a sustainable impact on the tourism industry is no foreign exchange earnings

6- Foreign investment on the unemployment rate does not have a lasting effect

7 - An effect of inflation shocks on economic growth is not sustainable;

8 - Effect of inflation shocks on sustainable tourism foreign exchange earnings

9 - Effect of inflation shocks on the unemployment rate is not sustainable;

10 - Effect of inflation shocks on foreign investment is not sustainable.

The matrix model *SVAR* with the following restrictions:

$$
\begin{bmatrix} \Delta GDP_t \\ \Delta FI_t \\ \Delta UNE_t \\ \Delta PC_t \\ \Delta IT_t \end{bmatrix} = \begin{bmatrix} B_{11} & 0 & 0 & 0 & 0 \\ B_{21} & B_{22} & 0 & 0 & 0 \\ B_{31} & B_{32} & B_{33} & 0 & 0 \\ B_{41} & B_{42} & B_{43} & B_{44} & 0 \\ B_{51} & B_{52} & B_{53} & B_{45} & B_{55} \end{bmatrix} \begin{bmatrix} U_t^{GDP°} \\ U_t^{FI} \\ U_t^{UNE} \\ U_t^{PC} \\ U_t^{IT} \end{bmatrix}
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(7)

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[27] K Numberis of variables

But due to the difficulty of interpreting the coefficients in the VAR non-binding patterns of the SVAR analysis of variance (VD) and the reaction functions for each of the structural shocks on the variables used The effect of structural shocks to the foreign exchange earnings in the tourism industry here on the variables of interest based on changes that will stop the reaction functions are as follows:
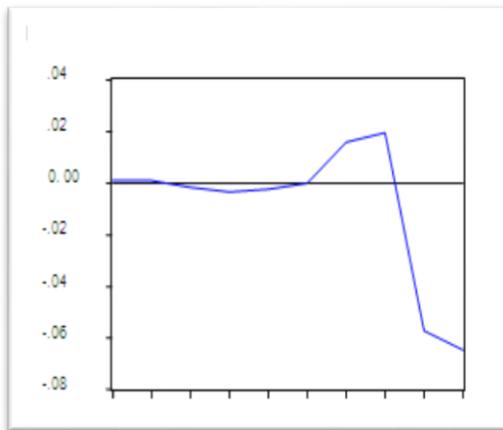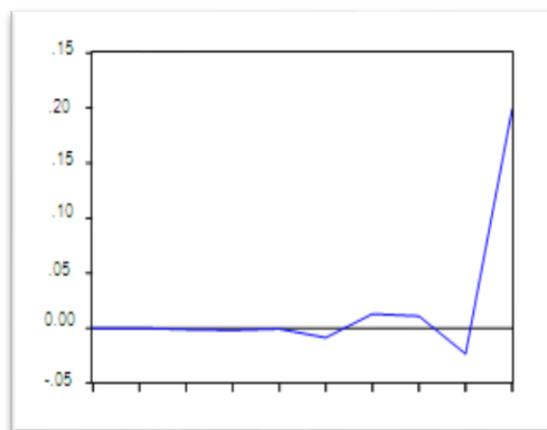
1) Trend inflation
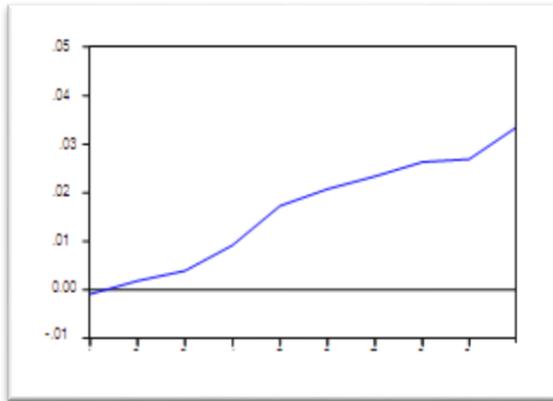
2)Trend of economic growth
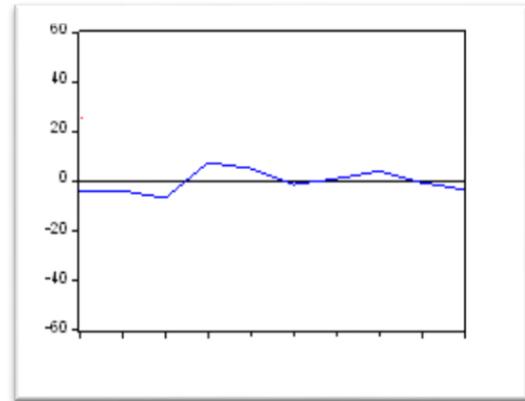
(3) The trend of foreign investment

(4) changes in the unemployment rate

Source: Research Findings

According to the diagram (1) an increase in tourism foreign exchange earnings, inflation has remained almost unchanged during the study. Growth trend of increasing foreign exchange earnings, as Chart 2 shows, during the period studied was always bullish. Moreover, the diagram (3) and (4), the effect of increased foreign exchange earnings, despite a lack of foreign investment and unemployment in the short term, in the long run, these two economic variables were found to increase and decrease.

6. Conclusion and Results

In this paper the importance of tourism foreign exchange earnings, in order to achieve increased earnings from its methods, Factors affecting the industry through a clear regression model was considered. The existing literature regarding the positive effects of tourism on other economic variables, its effect on variables such as unemployment, inflation, foreign investment and economic growth based on their structural imaging methods were described.

Foreign exchange earnings from tourism estimated model results indicate significant variables influencing global production, domestic prices relative to foreign prices and the increasing number of hotels. Thus, with regard to the latter two variables are under control of the country, the policy can control inflation and increase the number of foreign tourist arrival and hotel growth in tourism foreign exchange earnings will improve. In addition, there is a positive relationship between hotels and foreign exchange earnings, indicating the effective role of infrastructure in the economy is tourism.

The results from both regression and neural network-based foreign exchange earnings showed an increase during the 10 years it has investigated. However, foreign exchange revenue was forecast to earn foreign exchange through the neural network with the trend predicted by the OLS method have increased the oscillatory process.

The results of the effect of foreign exchange earnings of tourism on the variables considered suggests that increased foreign exchange earnings, economic growth and the trend is growing. Unemployment rate and foreign investment in not change the short term but did and increase, respectively, have been reduced. In addition, foreign exchange earnings increased almost no

effect on inflation. Therefore, creating and expanding tourism infrastructure without fear of rising inflation, foreign exchange earnings due to the increase and thus reducing unemployment and increasing foreign investment and economic growth.

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