A Comparative Analysis of Tourism Sectors of Azerbaijan, Turkey and Kazakhstan Through İnput-Output Tables

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ABSTRACT

The article assesses the impact of investments in the tourism sector on other sectors and the volume of production, as well as the level of employment in the country through the models developed on the basis of the "Input-output" tables for Azerbaijan's, Turkey's and Kazakhstan's economy. In addition, "Equilibrium Prices" model which is dual of Leontief's "Input-output model" has been prepared for all three countries, the dependencies between the value added in the tourism sector and the level of prices have been examined, and the effect of increasing value added in the tourism sector on other areas and the level of inflation has been determined.

The analysis of the simulation results carried out by models allows to determine the effectiveness of the investments in the tourism sector in comparison with other sectors for each of three countries.

Keywords: Input-Output model, Equilibrium Prices Model, employment, direct and indirect effects, investment.

JEL Classification: C15, C67, O13

1. INTRODUCTION

Nowadays, the tourism sector, which offers a multifaceted service, has become a major economic engine at a global level for the solution of the economic problems faced by national economies since the 20th century and for overcoming the bottlenecks appeared. This deterioration had important impacts on various countries, and in particular in developing countries, where the sector has become an increasingly relevant source of development. Today, the tourism sector alone accounts for around 30% of the world trade in services. According to the World Tourism Organization (WTO), the number of international tourists increased from

1,035 million in 2012 to 1,087 million in 2013 with an increase of 52 million, in 2015, it reached 1,186 million people with an increase of 99 million. International tourism revenues reached US $ 1.260 billion in 2015, while it was US $ 1.243 billion in 2012. In 2016, due to increasing terrorist activities, tourism income decreased to 22 billion 107 million 440 thousand dollars and average expenditure per person decreased to 705 dollars.

The purpose of this study is to find answers to the following questions based on the table input-output of Azerbaijan, Turkey and Kazakhstan.

- Effect of the investments on total output level and employment level in economic sectors (Investigation of the effect of 1 million USD investment in tourism sector on total output level and employment level in different sectors of tourism and economy in the country and comparative analysis).
- Interrelationship between price level and value added (how the 1% increase in value added in the tourism sector will change the price level in the sector itself, in different sectors of the economy and in the country).
- Effect of the increase of the final product on the total output level (The comparative analysis of the effect of 1% increase in the final product on the total output level in the sector itself and in different sectors of the economy).

2. INPUT-OUTPUT ANALYSIS

The inter-industry flow of goods and services is multifaceted and complex. To be able to plan the national economy, it is necessary to know the structure of the economy and the relations between sectors. Input-Output Analysis is a model that analyzes the inter-sectoral relations consistently with the help of the necessary mathematical and statistical analyzes. This basic information from which an input–output model is developed is contained in an inter industry transactions table. The rows of such a table describe the distribution of a producer’s output throughout the economy. "Input-output" tables are considered to be a mirror of the economy.

Input-output analysis is a technique used to investigate relationships between industries or sectors in an international, national or regional economy. This technique was developed by Wassillie Leontief. Input-output analysis is a method used to calculate the required output level of industries in an economy in order to fully meet the demand for the products produced. That is, the output of an industry can be an input of one or more industries or even itself. In short, the output of an

industry depends on the required input of other industries and the necessary inputs of an industry partially affect the output levels of other industries. (Erdoğan, 2004, s. 327).

Due to this mutual relationship between industries, a balance will be formed between total output and total input demands in the economy. One of the objectives of the input-output model is to determine the output level appropriate to the required inputs of all industries.

The United Nations (UN) regularly develops the methodology for the creation of "Input-output" tables suitable for today's market and proposes that the amendments to be made in the Member States should also be taken into account. (Rukavodtva po sostavleniyu tabliç zatrat-vıpuska i ix analizi, 2000, s. 304) .The end of the past century "İnput-output" tables to be created on the basis of the rules of our country's social-economic system more comprehensive "Social Accounting matrices" (SAM) has been prepared. SAM is part of the System of National Accounts (SNA) and is created by state statistical institutions in a number of countries. The General Equilibrium Model (GEM), established on the basis of SAM, has an excellent structure. At present, GEM models are used in more than 100 countries around the world to analyze and anticipate the country's socio-economic indicators (including the estimate of different tax revenues of the state budget). The creation and implementation of GEM is based on Leontief's "Input-Output" model.

A number of studies have been conducted in Azerbaijan based on the "Input-output" tables. After the declaration of the independence of the Republic of Azerbaijan, the first studies on the economy of Azerbaijan were carried out by Hasanli (2005), Hasanli and Suleymanov (2007), Imanov and others (2006), with the help of the "Input-output" tables. With the input and output model the number of jobs increased in Azerbaijan has been examined Abbasov and others (Abbasov A.M., 2007). In another study, comparative analyzes were made with the "Equilibrium Prices" model approach based on sectoral balance tables for the production and distribution of goods and services in the Azerbaijani economy in 2001 and 2006 (Hasanli Y., 2010). Hasanli and Salihova (2017) examined the tourism sector's relationship with other sectors of the economy.

Similar studies have also been made for the Republic of Kazakhstan. Thus, Hasanli and others have made a comparative analysis with the input-output model of the economies of Azerbaijan and Kazakhstan (2011). Then Bayzakov and others analyzed the input-output table for the years 2000-2011 (2014). Özdil and Turdaliyeva made a comparative analysis of the economies of Turkey and Kazakhstan with the input-output analysis approach and defined the sectors where

the two countries could contribute to economic cooperation and trade in the benefit of the two countries if converted into cost advantages for both Turkey and Kazakhstan (2014).

Many studies have been done with the input-output analysis approach for different sectors of the Turkish economy. Çakır and Bostan (2000), Dilber (2007), Sarıışık and others (2011), they investigated the effects of tourism on the Turkish economy.

3. THEORETHICAL AND METHODOLOGICAL BASICS OF "INPUT-OUTPUT" MODEL

The Sectorial Input-Output table is composed of three parts:

I part shows the mutual interconnections of sectors (rows indicates the intermediate goods, and the columns shows quantities of goods and services received from other industry sectors to perform their own production about to be intermediate consumption expenditures) (Calculation of GDP by production method);

II part shows the components of the final product (consumption, investment, public expenditures, exports, imports) (Calculation of GDP by expenditure method);

III part reflects the components of Value Added (wages, profit, depreciation, interest etc.), in other words, the calculation of GDP by income (Hasanli, 2011, s. 17)

The input-output model of W. Leontief (Leontief, 1979) is as follows:

$$X = \mathrm{A}X + Y \quad \text{or} \quad X = (\mathrm{E} - \mathrm{A})^{-1}Y \qquad (1)$$

The following equation is used to determine the effect of any i-sector of the economy on the total output amount in the final product itself($\Delta Y = (0, \dots 0, \Delta \mathrm{y_i}, 0, \dots, 0)$) and in other sectors ($\Delta X = \Delta \mathrm{x_i}, \dots \Delta \mathrm{x_{i-1}}, \Delta \mathrm{x_i}, \Delta \mathrm{x_{i+1}}, \dots, \Delta \mathrm{x_n}$):

$$\Delta X = \mathrm{B}\Delta Y \qquad (2)$$

The following equation is used to determine the impact of the change in the value-added of any i-sector of the economy on the price level in itself *($\Delta Y = (0, \dots 0, \Delta v_i, 0, \dots, 0)$)* and in other sectors ($\Delta \mathrm{P} = \Delta \mathrm{p_i}, \dots \Delta \mathrm{p_{i-1}}, \Delta \mathrm{p_i}, \Delta \mathrm{p_{i+1}}, \dots, \Delta \mathrm{p_n}$):

$$\Delta P = B^T \Delta v \qquad (3)$$

Here, the ΔP shows -price level, $the\ \Delta v - value - added\ ratio,$ B is the transpose of the total expense matrix.

The effectiveness of the total output amount on the employment can be determined by the following equation:

$$\Delta L = t\Delta X \quad \text{or} \quad \Delta L = tB\Delta Y \qquad (4)$$

Here, ΔY- indicates upcoming changes in employment (ΔL) as a result of the change in final product, t- is the direct labor density coefficient, in other words, the labor force needed to output a unit in each sector (person-hour, person-day, person-year).

4. EMİRİCAL ESTİMATİON IN THE CASE OF AZERBAİJAN, TURKEY AND KAZAKHSTAN

In this study, according to the report published by the statistical institutions the "İnput-output" simulations models for the 15 sectors of Azerbaijan economy (2006), 59 sectors of Turkey economy (TÜİK, 2002) and 29 sectors of Kazakhstan economy (ASRK, 2007) based on the "İnput-output" tables were carried out.

Table 1: The results of the simulation model of Azerbaijan, Turkey and Kazakhstan "İnput-output" (effect of $ 1 million increase of final product in tourism sector on output amount and employment, 1 $ = 1.7 AZN, 1 $ = 5.30 TL, 1 $ = 368.3 KZT).

	Effect on output quantity		Effect on employment Person/year	
	Multiplicator		In the direct tourism sector	Across the country
Countries/Sectors	Tourism industry	Across the country		
Azerbaijan	1,3	1,81	309	391
Turkey	1,3	1,99	88	151
Kazakhstan	1,4	1,98	143	248

As can be seen from Table 1, the effect of the increase of the $ 1 million of the final product (Y) in the tourism sector in each of the three countries varies according to the country. The reason for the increase in the final product more multiplier effect (1,99) in the tourism sector in Turkey, in Azerbaijan (1,81) in comparison with these countries (Kazakhstan and Turkey), the indirect relationship with other sectors of the economy of the tourism sector can be interpreted as being weak.

As a result of the same amount investment (1 000 000 US dollar, in Azerbaijan 1 700 000 AZN, in Turkey 3 500 000 TL, in Kazakhstan 368 281 000 KZT) in the tourism sector in all three countries, the consequences have found that direct tourism sector will create the 309 workplaces in Azerbaijan, in Turkey and Kazakhstan respectively 88 and 143 workplaces (person-years).

Appropriate values obtained for Azerbaijan are higher than in comparison with Turkey and Kazakhstan, and this stems from being low labor productivity and costs in Azerbaijan compared to these two countries. As mentioned above the number of business places to be more with the account of interest in Turkey is due to the tourism sector and its products are used less than in Kazakhstan and Azerbaijan in other sectors of the economy.

Table 2: The results of the "Equilibrium Prices" simulation model of Azerbaijan, Turkey and Kazakhstan (The effect of 1% increase in the value added of tourism sector on the price level of other sectors of the economy).

Countries/Sectors	Effect on price level,%	
	In tourism industry	Across the country
Azerbaijan	1,293	0,063
Turkey	1,29	0,052
Kazakhstan	1,404	0,134

As can be seen from Table 2, the 1% increase in the value added in the tourism sector affects more the price level (inflation) both in the sector and in the country.

Considering that Azerbaijan and Kazakhstan are petroleum countries, if the value added in the petroleum sector increases by 1%, let's look at the simulation results in order to determine the effect of price changes on the price level in the country through the "Equilibrium Prices" model.

Table 3: The results of the "Equilibrium Prices" simulation model of Azerbaijan, Kazakhstan and Iran

Countries/Sectors	Effect on price level,%	
	Direct to oil industry	Across the country
Azerbaijan	1,0064	0,4100
Kazakhstan	1,170	0,272

As can be seen from Table 3, the increase in the value added rate in the oil sector by 1% causes the price level (inflation) in Azerbaijan to be more affected than in

Kazakhstan. This result can be interpreted as the dependence of the Azerbaijan economy on the oil sector. In addition, the increase in the value added in the oil sector by 1% is due to the fact that the price increase in its sector is less than in Kazakhstan, because oil prices in Azerbaijan are under state control.

Table 4. The results of the "input-output" simulation of Azerbaijan, Turkey and Kazakhstan (Effect of 1% increase in final product (Y) on output quantity in tourism sector).

	Multiplicator		The effect of total output amount,%		Effect on the total final product quantity,%
Countries/ Sectors	In tourism industry	Across the country	In Direct tourism industry	Across the country	
Azerbaijan	1.358	1.807	0.00008	0.0011	0.001
Turkey	1.185	1.753	0.0011	0.0335	0.039
Kazakhstan	1.510	2.120	0.0017	0.048	0.042

According to the simulation results obtained, the total amount of 1% increase of the final product in the tourism industry affected mostly in Turkey (0.039%). The reason as mentioned that the tourism sector has weaker indirect relations with other sectors of the economy in Azerbaijan compared to Turkey and Kazakhstan. If we evaluate the total output rate in the tourism sector based on the total output ratio across the country, we could see the 7,3% increase in Azerbaijan, 3,3% in Turkey, 3,5% in Kazakhstan. This result shows that what we said above is correct.

5. CONSLUSİON

It is seen that the tourism sector started to increase its activity within the national economies starting from 2000 in the conditions of our world. The impact of the tourism sector on the country's economies is increasing in parallel with the acceleration of globalization and people's view of tourism as an indispensable part of welfare and living standards. An increase in the final demand of the tourism sector leads to an increase in the production of both the sector and other related sectors.

As a result of the analysis, it was found that the same amount of investment in tourism sector in all three countries would create more work place (person-year) in Azerbaijan in direct tourism sector. This is due to the low labor productivity and costs in Azerbaijan compared to the other two countries. The number of business places to be more with the account of interest in Turkey is due to the tourism sector and its products are used less than in Kazakhstan and Azerbaijan in other sectors of the economy. The increase in the value added rate in tourism sector by 1% affects

the level of price (inflation) in K azakhstan both in the sector and in the country. Since the Azerbaijani economy is more dependent on petroleum than Kazakhstan, the increase in the value added rate in the oil sector causes the price level in Azerbaijan to be more affected than in Kazakhstan. Moreover, the increase in the value added in the oil sector by 1% is due to the fact that the price increase in its sector is less than in Kazakhstan, because oil prices in Azerbaijan are under state control. According to the simulation results obtained, the total amount of 1% increase of the final product in the tourism industry affected mostly in Turkey. The reason that the tourism sector has weaker indirect relations with other sectors of the economy in Azerbaijan compared to Turkey and Kazakhstan.

Considering the results, investment in the tourism sector in all three countries has a positive impact on the country's economy and other sectors of the economy. Thus, as the amount of capital to be included in the tourism sector increases, tourism revenues will increase. Intensive promotion and investment activities should be carried out in order to get a share from these increased revenues. In order to maintain these activities in a healthy and effective manner, economic sectors participating in tourism activities should be supported and correct economic policies should be followed.

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APPENDIXES

Appendix 1. Results of the ”input-output“ simulation models of Azerbaijan

Sectors	Code	Change of the final product, Thousand AZN	Multiplier	Change in the number of employees, person-years	Change of final product,%	Change of total output,%	Change of total employment,%
Agriculture, hunting and forestry products	1		0.0	24.2		0.0006	0.0002
Fishing Products	2		0.0	0.0		0.0002	0.0001
Mining industry	3		0.1	0.4		0.0006	0.0001
Processing industry	4		0.2	11.8		0.0002	0.0006
Electricity, gas and water	5		0.0	2.8		0.0006	0.0007
Construction works	6		0.1	12.2		0.0002	0.0006
Trade services	7		0.0	11.1		0.0006	0.0002
Tourism	8,9,11	1700	1.3	309	1.0	0.00008	0.0001
Financial intermediation, insurance and pension services	10		0.0	0.5		0.0004	0.0004
Education services	12		0.0	1.1		0.0000	0.00004
Healthcare and social services	13		0.0	0.3		0.0000	0.00002
Public adminstration and defence, compulsory social insurance services	14		0.0	13.7		0.0005	0.00059
Communal and other services	15		0.0	3.3		0.0003	0.00025
TOTAL		1700	1.8	391	0.001	0.0011	0.00103

Appendix 2. Results of the ”input-output“ simulation models of Kazakhstan.

Sectors	Code	Change of final product, thousand tenge	Employment, person-year	Change of added value,%	Price change, %	Change of final product,%	Change of total output level,%
Agriculture, hunting and forestry	1		37		0.065		0.004
Fishing	2		0		0.001		0.005
Coal and lignite, extraction of peat	3		0		0.004		0.015

Row oil and natural gas extraction	4		0		0.055		0.009
Metal ore mining	5		1		0.016		0.021
Other mining and quarrying industries	6		0		0.004		0.031
Processing of agricultural products	7		2		0.065		0.005
Textiles industry	8		1		0.004		0.035
leather, leather products and footwear manufacturing	9		0		0.000		0.005
Wood and wood products production	10		0		0.013		0.127
Paper and paperboard production, printing	11		0		0.011		0.030
Coke, refined petroleum products and nuclear fuel production	12		0		0.037		0.049
Chemical industry	13		1		0.013		0.043
Rubber and plastics production	14		1		0.023		0.072
Production of other non-metal mineral products	15		2		0.030		0.068
Metallurgy and metal processing	16		2		0.083		0.023
Machinery and equipment repair, spare parts manufacturing	17		1		0.026		0.021
Other manufacturing industries	18		0		0.002		0.013
Production and distribution of electricity, gas and water	19		3		0.029		0.037
Construction	20		1		0.008		0.002
Trade and repair of household goods	21		47		0.034		0.126
Tourism	22,23, 26	368300	143	1.0	1.404	1.0	0.002
Post and telecommunications	24		2		0.029		0.045
Financial industry	25		2		0.028		0.011
Education	27		0		0.000		0.000
Healthcare and social services	28		0		0.000		0.000
Other utlity and social services	29		1		0.002		0.004
Total		368300	248	0,70	0.134	0.042	0.048

Appendix 3. Results of the "input-output" simulation models of Turkey (2002).

Products	Code	Change of final product, thousand TL	Employment, person-year	Change of the mixed value ratio,%	Change in price level,%	Final product change,%	Total output change,%
Products of agriculture, hunting and related services	1	0,0	5		0.008		0.01
Products of forestry, logging and related services	2	0,0	10		0.006		0.02
Fish and other fishing products; services incidental of fishing	3	0,0	12		0.010		0.02
Coal and lignite; peat+Uranium and thorium ores	4	0,0	0		0.011		0.02
Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	5	0,0	1		0.010		0.43
Metal ores	7	0,0	0		0.023		0.03
Other mining and quarrying products	8	0,0	0		0.019		0.03
Food products and beverages	9	0,0	1		0.019		0.01
Tobacco products	10	0,0	0		0.018		0.00
Textiles	11	0,0	1		0.023		0.00
Wearing apparel; furs	12	0,0	0		0.024		0.00
Leather and leather products	13	0,0	0		0.022		0.00
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	14	0,0	0		0.026		0.01
Pulp, paper and paper products	15	0,0	1		0.024		0.03
Printed matter and recorded media	16	0,0	1		0.022		0.03
Coke, refined petroleum products and nuclear fuels	17	0,0	0		0.023		0.06
Chemicals, chemical products and man-made fibres	18	0,0	1		0.025		0.03
Rubber and plastic products	19	0,0	1		0.026		0.03
Other non-metallic mineral products	20	0,0	1		0.022		0.03
Basic metals	21	0,0	1		0.028		0.03
Fabricated metal products, except machinery and equipment	22	0,0	1		0.026		0.02
Machinery and equipment n.e.c.	23	0,0	1		0.022		0.01
Office machinery and computers	24	0,0	0		0.029		0.09
Electrical machinery and apparatus n.e.c.	25	0,0	0		0.024		0.02
Radio, television and communication equipment and apparatus	26	0,0	0		0.027		0.01
Medical, precision and optical instruments, watches and clocks	27	0,0	0		0.026		0.01
Motor vehicles, trailers and semi-trailers	28	0,0	1		0.027		0.02
Other transport equipment	29	0,0	1		0.019		0.03
Furniture; other manufactured goods n.e.c.	30	0,0	0		0.028		0.01
Secondary raw materials	31	0,0	0		0.032		0.03
Electrical energy, gas, steam and hot water	32	0,0	0		0.013		0.02
Collected and purified water, distribution services of	33	0,0	0		0.005		0.02

water							
Construction work	34	0,0	0		0.019		0.00
Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel	35	0,0	4		0.022		0.03
Wholesale trade and commission trade services, except of motor vehicles and motorcycles	36	0,0	3		0.025		0.01
Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	37	0,0	4		0.022		0.01
Tourism	38,39, 40,41, 42,47, 57	3500	88	1	1.289	1	0.0011
Post and telecommunication services	43	0,0	1		0.020		0.013
Financial intermediation services, except insurance and pension funding services	44	0,0	2		0.022		0.023
Insurance and pension funding services, except compulsory social security services	45	0,0	0		0.015		0.028
Services auxiliary to financial intermediation	46	0,0	0		0.020		0.024
Renting services of machinery and equipment without operator and of personal and household goods	48	0,0	0		0.040		0.031
Computer and related services	49	0,0	0		0.016		0.015
Research and development services	50	0,0	0		0.023		0.027
Other business services	51	0,0	4		0.014		0.022
Public administration and defence services; compulsory social security services	52	0,0	0		0.018		0.000
Education services	53	0,0	0		0.008		0.001
Health and social work services	54	0,0	0		0.024		0.001
Sewage and refuse disposal services, sanitation and similar services	55	0,0	0		0.012		0.067
Membership organisation services n.e.c.	56	0,0	1		0.013		0.004
Other services	58	0,0	0		0.016		0.001
Private households with employed persons	59	0,0	0		0.000		0.000
Total		3500	151	0.029	0.052	0.039	0.0335