

## **The Contribution of ICT to the Development of Tourism in Uzbekistan**

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### **Introduction**

This year has been named “2021- the Year of Supporting Youth and Protecting the Health of the Population”. Due to economic reforms that were made during the years of independence, many firms were established and on the ICT basis modern management systems were introduced. Nowadays the share of ICT in GDP is accounted for 1.9% and it is planned to increase it up 10 per cent by 2030. But the return from investment directed to the tourism is still very low. It is well known, that investments directed to tourism of Uzbekistan could lead to the development of science and technologies, to better administration of firms and improvement of living conditions of people, and wide use of ICT is becoming a major factor in the modernization of the sector. All these dictate the necessity of using ICT, new technologies in deepening of provided economic reforms and structural changes, in efficient exploitation of resources, in implementing of long - term economic programs and increase of their productivity. The tourism sector is no exception.

In order to generate the econometric model time series data was utilized. The study was created based on existing theoretical model and it was implemented using deductive approach. In order to collect data we used two sources: ICT investments were obtained from the International Telecommunication Unit, World Bank Open data for the period between 2010 and 2020, Statistical Committee of the Republic of Uzbekistan. These include the statistical and empirical data on economic growth, investment, labor supply, hotel places. The production function is as a type of transformation function where inputs are transformed into output. Production functions play a role in many business disciplines. Several different production functions have played an important historical role in economics. Our research is employing the Cobb-Douglas function to check the correlation between ICT investment, labor, hotel places and tourism output in Uzbekistan, and find out coefficients of them. They will help to give the industry frame philosophy to management ICT investment in tourism efficiently. In the other hand, when the society pursuit some certain quantity of output, the research will give recommendation how much factors changing can make it possible.

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The issue of ICT and economic growth has received much attention with respect to the developed countries as opposed to the developing countries. Yousefi, A., [1], highlighted that ICT enhances economic growth of developing countries by way of: providing cheaper, quality, and empowered communication to marginalized communities. Majority of empirically analyzed papers found out that development of ICT use leads to growth in GDP per capita, employment and productivity in a country. According to the research conducted by the World Economic Forum (World Economic Forum, 2013) a 10 percent rise in the ICT sector of a country leads to a 0.76 percentage rise in GDP per capita, also a 1.03 percentage increase in the rates of employment.

Variable selections. The variables used in the research paper and their definitions are given as follows: Tourism GDP – dependent variable; measured as a real sector's output (man.\$); Investment ((mln.\$); Employment – measured as a number of persons and hotel places, measured in units. The regression-assumptions and several tests recommended by empirical econometric-literature (Stock, J, 2011) have been checked, in order to choose the model, which best shows the impact of ICT use on economic growth. Stock J. (2012) stated that standard-stationary tests are generally for huge-sample size of data set, as sample-size of the implemented data is not very large, any stationary tests have not been applied. Taking into account this statement he stationary test of time series data was not provided. The following equations were used in the research [2]:

$$\text{Tourism GDP} = \beta_0 + \alpha \text{ Investment} + \beta_1 \text{ Labor} + \beta_2 \text{ Hotel places} + u_i \text{ and (1)}$$

$$\text{Cobb – Douglas model: } \ln \text{ Tourism GDP} = \ln \beta_0 + \alpha \ln \text{ Investment} + \beta_1 \ln \text{ Labor} + \beta_2 \ln \text{ Hotel places} + u_i \quad (2)$$

### Main Part

In this study, econometric models have been utilized to evaluate each of the growth indicator variables empirically. Each growth indicator variable has been used to find how they relate to the growth rate of tourism industry in Uzbekistan. The overall growth models that have been estimated in this study by using the pooled Ordinary Least Squares (OLS), employing time series data. By this way it is possible to detect the extent by which the growth rate is influenced by the variables above and the extent by which most likely ICT investment policy impacted the growth rate.

Analysis of descriptive statistics show that variables distributed normally because their averages and means are close to each other. The findings of the descriptive analyses, tests and statistics indicated that all sampled variables have positive but not all of them are significant for the chosen period of time. Overall outcome of the study adduced that each of the chosen indicators meets all the requirements of regression analyses. To define the more appropriate estimating model techniques, first of all, we used linear regression models with the assumption that analyzing the impact of variables vary over time. Besides, there is also an important assumption that those time-invariant characteristics are unique and they are not correlated with other individual characteristics. From the regression results it can be observed that except hotel places all variables have significant effect on the dependent variable. P-values of those variables less than 0.05, so hypothesis of two-tail p-values test was rejected. Moreover, t-value test hypothesis also rejected, except a variable, all independent variables have significant influence on the dependent

variable. Almost all variables' t- values are more than 1.96, so higher t-value the higher the relevance of the dependent variable. F-test showed that regression models are proper. The panel data of the selected countries to describe the causality between information and communication technology has been tested for the Correlation matrix of residuals Test in order to show the independency of the variables in the model selected. The finding from the test released that all the explanatory variables and control variables have less than 1.00 and this means there is no correlation between the variables and they are fully independent from each other.

However, we also applied Cobb – Douglas type regression models (linear - log models). From the regression results, it can be seen that, unlike linear models, all variables have significant influence on the dependent variable, so p-value of each independent variable lower than 0.05 as well as t-value of all independent variables are higher than 1.96 as mentioned above more t-value the more the relevance of the outcome variable

The Solow residual is a number describing empirical productivity growth in an economy from year to year and decade to decade. Robert Solow defined rising productivity as rising output with constant capital and labor input. It is a "residual" because it is the part of growth that cannot be explained through capital accumulation or the accumulation of other traditional factors, such as land or labor. The Solow Residual is procyclical and is sometimes called the rate of growth of total factor productivity. Generally, tourism sector technical contribution ratio (TCA) is generalized explained as the contribution of tourism technology development to the sector's output growth rate, which including the benefit of science technology development and tourism policy amending, management and service progress. Here we set:

$$R_{TTC} = (R_{TGDP} - I_{GR} * \alpha - L_{GR} * \beta) / R_{TGDP} \quad (3)$$

Where

**R<sub>TTC</sub>**: The Tourism Tecnology Contribution ratio

**R<sub>TGDP</sub>**: Tourism GDP increasing rate

**I<sub>GR</sub>**: Investment growth rate

**α**: Investment output elasticity

**L<sub>GR</sub>**: Labor growth rate

**β**: Labor output elasticity

The elasticity factors can employ Cobb-Douglas production function to obtain, in Uzbekistan the elasticity of Investment, Labor accordingly is 0.79, 0.11. The **R<sub>TTC</sub>** is to analysis tourism development and technology renovation, labor and capital development trend in long run, and is also very important for make a country's tourism development strategy.

At the beginning we investigated and examined empirically the unidirectional causality between economic growth of a country and tourism sector. There is a positive relationship between GDP and output of tourism sector. For example, one per cent increase of GDP; other factors are held constant, leads to 2.88 percent of the sector. This relationship is associated through investments on ICT infrastructure and Internet use. Thus we moved on to the analysis of the influence of ICT development on tourism sector's output. Our findings state that capital, labor resources influence on output positively while hotel places negatively. This is a reality because in tourism development now shortage of hotel places put constraints on the sector development. One per

cent increase of investments (including also ICT investments) into tourism sector is associated by 0.79 percent increase of output. Labor elasticity coefficient is smaller – 0.11. Using the Cobb – Douglas type model, by applying formulae (3) we calculated the technology contribution ratios for 2017 to 2020 years.

**Table - 3. Contribution of ICT to Tourism sector development**

Indicators	2017	2018	2019	2020	2021 (plan)
Contribution of ICT, %	6.98	77.6	11.83	7.88	7.62
Share, %	56.3	85.8	45.3	30.2	28.5
Real Output Growth, %	12.4	90.4	26.1	26.1	25.1

Source: The author's estimations using EViews -9.

Having analyzed the data implemented and obtained results, the possible interpretation and explanation with the empirical literature review, the following conclusions are driven. As a result, we could say that ICT drives the economy and also effective ICT investments do have a positive impact on the economy and its branches.

Based on the analyses and evaluations driven from the current research, several policy recommendations can be suggested. In order to encourage sustainable economic development, governments and policy makers in Uzbekistan should put more emphasis on rising investment in mobile-phone sector, since this infrastructure is much cost effective and useful rather fixed line phones. Additionally, authorities are supposed to promote and increase ICT usage to penetrate internet use and broadband acceptance. To improve government management and increase efficiency in public-administration, the authorities should apply e-government. Moreover, they should encourage expanding of ICT usage in private business and organizations sectors as well by several policy remedies for example: tax reductions, subsidy, improving e commerce and promoting public

### **Conclusion**

The obtained results based on the recent implications promises that the future direction of ICT can contribute to the economic growth more if relevant measures and steps are taken. Nowadays the ability to create, distribute and exploit knowledge has become a major source of competitive advantage, wealth creation and improvements in the quality of life. Some of the main features of this transformation are the growing impact of information and communications technologies (ICT) on the economy and on society.

Besides this, any technology implementation has a strong relation with human resource knowledge background. Therefore, education and training of tour operators will also take some time. Some suggestions could be made based on our research results. Nowadays in the conditions of increasing competition in industries especially in tourism sector, an implementation of modern information-communication technologies (ICT) in tourism sector boosts the competitiveness of firms, of small businesses and of private entrepreneurial entities, which makes possible to gather and process high volume of information for organizing strategic management.

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