



# Impact of innovative background of the economy on performance and competitiveness in the tourism industry

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## Abstract

The impact of innovation on tourism industry's performance is a topic that is addressed in several works. They point to the specifics of innovations in the tourism industry, which are predominantly represented by incremental innovations. This is related to the low-knowledge intensity of the production of services in tourism industry. However, the changes in demand, the strength of competition and the technological advancement of business partners have triggered the penetration of innovation into the tourism industry. The aim of the study was to assess the impact of the innovative background of the economy on the performance and competitiveness of the tourism industry. For correlation and regression analysis we have used Spearman's rank correlation coefficient and Pearson correlation coefficient. As for variables, the values of the countries in The European Innovation Scoreboard and the Travel & Tourism Competitiveness Index as well as the labour productivity values achieved in the tourism industry have been used. The results of the analysis confirm that the innovative background of the economy is a factor affecting the competitiveness of the industry and the innovative performance of the EU economies can be described as a precondition for the economic performance of the tourism industry.

**Keywords:** tourism, innovation, competitiveness, labour productivity, performance.

## Introduction

Innovation and innovativeness of enterprises are described as a source of competitiveness and economic growth (Schumpeter, 1939). In the service production environment, the issue of the impact of innovations on business performance is documented by many researches and authors. However, monitoring of the relationship between innovations and performance in services is influenced by the specifics of services that are heterogeneous and produced with different knowledge intensity and different degrees of production standardization. Also, the typology of innovations plays an important role in identifying this relationship. Enterprises in tourism industry represent low- knowledge intensity production and the standardization rate of their production is very different. It is defined by the nature of the product and the degree of its customization. Empirical results support the fact that the tourism industry shows differentiated innovative behaviour in the service sector. Hjalager (2010) mentions two determinants of how innovations affect economic performance in the tourism industry: the type of innovations and the type of enterprise. He also considers localization and related networking as driving forces of the current tourism industry.

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industry. The aim of the study is to assess the impact of the innovative background of the economy on the performance and competitiveness of the tourism industry.

## Literature review

As research by Camison, Monfort-Mir (2012) shows, the enterprises operating in the tourism industry are less technologically innovative than those operating in manufacturing and other services, and they, in particular, carry out incremental innovations based on previously available knowledge within the organization, which allows imitators and adapters to essentially outnumber real innovators. The innovative behaviour of the enterprises operating in the tourism industry focuses more on non-technological innovation. The results also support internal heterogeneity in the area of the tourism industry, namely, the innovations sphere.

Compared to manufacturing, innovations in services are driven by practical experience rather than research activities. Employees, consumers, suppliers and other partners are more involved in development processes (Nepierala & Szutowski, 2019; Knošková, 2015). The relevant service business environment is thus an important factor in innovative activities. All activities in the area of concentration and exchange of knowledge within various forms of networking are therefore justified. This is particularly the case in the services environment, especially those produced with a high consumer participation rate (prosumer). Tourism industry services are clearly identified in this way.

Tourism industry enterprises are clearly users of innovations, not producers, and prefer incremental innovations. However, it is common ground that the use of modern technologies is a necessity in the tourism industry, especially in the field of ICT. The focus is also on the use of robots, artificial intelligence and service automation. These elements offer several impacts in the tourism industry environment, in the areas of operations management, human resource management, marketing management and financial management (Ivanov & Webster, 2019). The intensity of competition in the relevant market determines innovativeness in the tourism industry. It puts pressure on innovation activity and exploits all possible sources of innovations (Hjalager, 2010). The tourism industry is a cross-cutting industry and the value chain of products is influenced by the quality of inputs from various industries. The supply chain in tourism does not only include basic services as well as other auxiliary services or those related to the tourism industry (Tigu, Călărețu, 2013). The final product of the tourism industry is locally linked to a specific environment, the quality of which is also conditioned by many inputs. Thus, the production of tourism services creates a complex mechanism. Its proper functioning is conditioned by the ability of individual elements to respond to changes and to flexibly introduce innovations of various types.

The technological demands of business partners and the availability of technologically advanced solutions can promote the penetration of innovations into the tourism industry and positively influence its performance. This is supported by the outcome of research on the intensity of the relationship between tourism and knowledge intensive business services (KIBS) in Poland. KIBS providers offer external specialization and expertise, and can provide strong support in generating new concepts and solutions (Borodako, 2015). Hjalager (2010) also mentions technological pressure of the environment as a determinant of innovation in the tourism industry. The wider impact of a massive technology push on tourism, destinations and subsequent innovations still has to be investigated. At the same time, the cluster is described as a tool enhancing innovation activity in the tourism industry (Michálková, 2010). If the technology, applied in the relevant tourism environment, puts pressure on the use of innovation in the tourism industry enterprises themselves, demand creates an incentive pull for the enterprises. Customization is a key element in contemporary innovativeness in tourism. Client sophistication, information availability, generational exchange of consumer segments are the factors that push for the development and use of progressive technologies. The self-service technologies (SST) are the norm in a contemporary tourism sector (Kelly, Lawlor & Mulvey, 2017). The conceptual framework of SST adoption lists technology anxiety, technology



readiness, preference for personal contact, customer demographic characteristics, risk and situation influences as factors of SST adaptation (Kelly, Lawlor & Mulvey, 2019). The presence of these factors and their positive stimulating effects are closely related to the maturity of the innovative culture in society and the innovative potential and performance of the economy. The innovative progress of the tourism industry is determined by the innovative background of the economy. We assume that the quality of the innovative environment of the economy positively affects the penetration of innovation into tourism industry and subsequently the performances that tourism industry achieves.

Grisseemann, Plank and Brunner-Sperdin (2013) report that *“innovation management and customer orientation have been widely recognized as a key factor in enhancing the business performance of the Alpine hotels.”* This study shows that *“the effect of hotels’ customer orientation exceeds the effect of innovativeness and innovation behaviour on financial and non-financial business performance.”* Other authors have also mentioned the positive relationship between innovation and business performance in the tourism industry (e.g. Han et al., 1998; Li & Atuahene-Gima, 2001; Hult et al., 2004; Gundayetal, 2008; Rubera & Kirca, , 2012; Nepierala & Szutowski, 2019). Lin (2013) states in his work that service innovation affects company’s performance in both direct and indirect ways, with the quality of services playing a positive mediating role and direct impacts being more significant than indirect.

The abnormal returns are one of the possible measures of tourism company performance. *“The positive impact of innovation on abnormal returns”* was confirmed by Nepierala, Szutowski (2019). *“The abnormal returns resulting from collaborative development are more significant when introduced in less innovative economies (mainly Central and Eastern Europe). The geographical context of innovative benefits has also been confirmed: a positive relationship between the degree of novelty and abnormal returns. Also, the impact of collaborative knowledge on abnormal returns was positively verified”* (Nepierala & Szutowski, 2019).

On the other hand, there have been documented research results, which confirm the positive impact of innovation on tourism performance only partially. In terms of typological differentiation of innovations, *“non-environmental innovations and only some specific environmental innovations have been found to have a positive impact on hotels performance”* (Tugores & García, 2015). Other findings declare that investments in hotels innovation do not directly and positively affect their short-term performance, but are important in achieving their medium- and long-term performance (Campo, Díaz & Yagüe, 2014). Non-significant, even negative relationship between innovations and tourism industry performances can be found in the work of several authors (e.g. Birley & Westhead, 1990; Jaworski & Kohli, 1993; Heunks, 1998; McGee et al., 1995; Guisado-Gonzalez et al., 2013). However, the innovation effects come with a time lag, especially in a service production environment that has inseparable and intangible features and consumption is based on experience or trust. It is therefore justified that the positive impact of innovation on productivity and economic growth can be revised, also rejected due to incorrect selection of evaluation parameters (Kubičková, 2016).

The fact that innovations are described as a source of competitiveness in tourism industry reflects the following definition published by the OECD: *„Tourism competitiveness for a destination is about the ability of the place to optimise its attractiveness for residents and non-residents, to deliver quality, innovative, and attractive (e.g. providing good value for money) tourism services to consumers and to gain market shares on the domestic and global market places, while ensuring that the available resources supporting tourism are used efficiently and in a sustainable way.”*( Dupeyras & MacCallum, 2013)

Labour productivity in tourism service is the core indicator competitive measurement in tourism. It indicates an ability of a destination to deliver quality and competitive tourism services. A measure providing evidence of the productive potential of the tourism economy (Dupeyras, MacCallum, 2013). Labour productivity (total revenue per employee; value added



per employee) is one of the monetary variables used to measure productivity in travel, tourism and hospitality (Ivanov & Webster, 2019).

Labor productivity is influenced by the degree of representation of innovations in the production process. This is due to the effects of labour cost savings and increased sales (Ivanov, 2019). The reduction in quality assurance costs is also essential. Therefore, the study of the impact of innovative performance of the EU economies on labour productivity in tourism industry is the subject of our study.

### Research methodology

The aim of the study is to determine the relationship between the innovative background of the economy and the performance of the tourism industry. We perceive the innovative background of the economy as a synchronous existence of innovative culture, innovative potential and innovative performance in the economy. All these elements are part of the European Innovation Scoreboard (EIS) indicators. We assume that the innovative background (indicated by innovative performance within the EIS) of the economy has a positive impact on the economic performance of the tourism industry and ultimately, its competitiveness.

**Research question 1:** Is the innovative background of the economy a factor affecting the competitiveness of the tourism industry?

*H0: there is no link between the innovative performance of the economy and the competitiveness of the tourism industry*

*H1: there is a link between the innovative performance of the economy and the competitiveness of the tourism industry*

The verification of this relationship is realized through two evaluation systems: the European Innovation Index and the Travel & Tourism Competitiveness Index. We used the Spearman's Rank Correlation Coefficient method in the listed ranking systems and the 28 EU countries. The temporal asynchrony of the evaluation systems used (EIS and TTCI) determines the timeliness of the expression of the relationship between the innovative performance of the economy and the competitiveness of its tourism industry. The comparison year is 2017 for both evaluation systems.

**The European Innovation Scoreboard (EIS)** (known as the Innovation Union Scoreboard from 2010 to 2015), was developed as a tool to assess and compare the innovative performance of the EU Member States. This ranking has been regularly compiled since 2001 and includes a comparison of the EU regions (Regional Innovation Scoreboard) every two years. Measurement of EIS is based on the evaluation of 27 indicators integrated into 4 groups: framework conditions, investments, innovation activities, impacts. Based on the values achieved, the countries evaluated are divided into 4 following groups (European Commission, 2018, 2019):

**Innovation leaders** - we include here the countries that achieved the best results in the period under review. In the long term, these include mainly the Nordic countries such as Sweden, Denmark, Finland, but also the Netherlands, the United Kingdom and Germany. In the 2018 assessment, there are 4 countries that reached an EIS of around 120% of the European average: Sweden, Denmark, Finland, and the Netherlands.

**Strong Innovators** – those are the countries with innovative performance above the European Union average. In particular, Austria, Luxembourg, Belgium, Norway, Ireland and France, but this group also includes countries such as Slovenia, whose level of innovative performance is just below the European Union average. In the 2018 assessment, this includes 8 countries that achieved an EIS of 90% - 120% of the European average: Austria, Belgium, Estonia, France, Germany, Ireland, Luxembourg, and United Kingdom.



**Moderate Innovators** - a group of countries whose innovative performance has reached the average or below the EU average. In the EIS 2017 index, this group includes Czechia, Portugal, Estonia, Latvia, Spain, Malta, Italy, Cyprus, Slovakia, Greece, Hungary, Lithuania, Poland and Croatia. In the 2018 ranking, this includes 14 countries with a performance of 50% -90% of the European average: Croatia, Cyprus, Czechia, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Slovakia, Slovenia, and Spain.

**Modest Innovator** – in comparison with the assessed countries, their results are below the European Union average, namely Romania and Bulgaria.

**Travel & Tourism Competitiveness Index (TTCI)** - is a method of the World Economic Forum, designed to monitor the competitiveness of countries in the tourism industry. The launch of this index began in 2007 and is linked to a nationwide observation, which is expressed by the Global Competitiveness Index. Overall, it assesses the countries according to the data collected in five dimensions: business environment, safety, health and hygiene, human resources and labour market, use of ICT. The dimensions are elaborated into 14 pillars containing more detailed indicators: Business Environment, Safety and Security, Health and Hygiene, Human Resources and Labour Market, Prioritization of Travel and Tourism, International Openness, Price Competitiveness, Environmental Sustainability, Air Transport Infrastructure, Ground and Port Infrastructure, Tourist Service Infrastructure, Natural Resources, Cultural Resources and Business Travel.

Every two years, the World Economic Forum publishes a comprehensive report assessing the competitiveness of the countries in the tourism industry, where the aforementioned competitiveness index is located. The index in the 2017 report compares 136 countries (in 2018, it compares 140 countries) on the basis of 14 evaluation parameters supporting the development of tourism industry (World Economic Forum, 2017, 2019).

Within the correlation analysis we use the **Spearman's rank correlation coefficient**. By using it we compare the linear dependence between two variables X and Y in the form of order. The formula for calculation of Spearman's rank correlation coefficient is following:

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

where: n - the number of observations

$d_i$  - the difference between the two ranks of each observation

$\sum d_i^2$  - the sum of squared differences

The statistical significance of the relationship between the two variables determined at the significance level  $\alpha = 0.05$  is found by formulating the null hypothesis, which states that there is no correlation between the monitored variables. Since the sample size is less than 30, we have used the corresponding critical value statistics table when comparing.

**Research question 2:** Is the innovative performance of the EU economies a precondition for the economic performance of the tourism industry?

*H0: there is no link between the innovative performance of the economy and labour productivity in the tourism industry*

*H1: there is a link between the innovative performance of the economy and labour productivity in the tourism industry*

The hypothesis was verified by the correlation and regression analyses using the Gretl statistical software and Microsoft Excel spreadsheet. The innovative performance of the



economy is defined by EIS values in the 27 European countries achieved in 2017 and tourism industry performance is expressed in terms of labour productivity (gross value added per employee) achieved in the section I (accommodation and catering services) in 2017 registered in the Eurostat statistical database (Table 1). The relationship of both variables was determined using Pearson’s correlation coefficient (r) and determination coefficient (r<sup>2</sup>), the dependency graph has been used, where in the position of the dependent variable (y) the labour productivity is the performance indicator and EIS values of the European countries are independent variables (x).

According to Grančay et al. (2013), the correlation coefficient (r) is from -1 to +1. The closer the coefficient is to 1, the stronger the relationship between the variables. A positive value of the coefficient determines the same direction of the variables to be compared (that is, if the variable X increases, so does Y). Negative coefficient values indicate the opposite direction of the variables (X increases, Y decreases or vice versa). The strength of dependence is further interpreted according to the coefficient amount as follows:

(± 1) – Very high positive (negative) correlation

(± 0.7; ± 1) – High positive (negative) correlation

(± 0,4; ± 0,7) – Moderate positive (negative) correlation

(0; ± 0.4) - Low positive (negative) correlation

If the correlation coefficient of two variables is zero, it signifies that there is no linear relationship between the variables.

In the regression analysis, we have been interested in the regression line equation, whose form is as follows:

$$y' = b_0 + b_1X$$

$y'$  = theoretical values of dependent variable

$b_0$  = constant

$b_1$  = regression coefficient

$X$  = values of independent variable

The quality of regression analysis is determined by indicators of determination coefficient (r<sup>2</sup>), t-statistic, p-value constant and number of observations (N).

**Table 1:** Database for calculating the relationship between innovative performance of economy and labour productivity in tourism industry

Country	Labour productivity in section I (in Eur)	Labour productivity in division I55 (in Eur)	EIS value
Belgium	43 700	61 300	119
Bulgaria	7 200	11 900	47
Czechia	18 400	26 700	82
Germany	20 900	29 100	121
Estonia	13 600	19 600	78
Ireland	27 600	32 700	114
Greece	8 800	26 400	67
Spain	26 600	44 900	77
France	42 800	54 200	107
Croatia	19 800	34 400	54
Italy	31 600	52 300	74



Cyprus	27 200	33 400	73
Latvia	8 600	13 700	78
Lithuania	9 200	18 300	47
Luxembourg	37 200	52 400	119
Hungary	11 300	21 200	66
Malta	25 800	35 600	75
Netherlands	28 100	43 400	127
Austria	37 700	49 200	119
Poland	15 800	24 700	54
Portugal	20 800	34 100	81
Romania	8 800	12 800	33
Slovenia	25 500	35 000	96
Slovakia	10 000	15 000	67
Finland	36 600	47 200	128
Sweden	41 600	49 500	141
United Kingdom	24 900	37 300	123

Source: Author's own based on EIS, 2018 and Eurostat

### Findings and analysis

The following text of the study demonstrates the verification of the hypothesis linked to the research question 1: *Is the innovative background of the economy a factor affecting the competitiveness of tourism industry?*

The question is answered by means of established hypotheses:

*H0: there is no link between the innovative performance of the economy and the competitiveness of the tourism industry*

*H1: there is a link between the innovative performance of the economy and the competitiveness of the tourism industry*

Table 2 shows the input data needed to calculate the Spearman's rank correlation coefficient.

**Table 2:** Relationship between innovative performance and the EU 28 countries' competitiveness of tourism industry in 2017

	A	B	A-B
Country	Ranking by EIS 2017	Ranking by TTCI 2017	Difference
Sweden	1	9	-8
Denmark	2	14	-12
Finland	3	16	-13
Netherlands	4	8	-4
United Kingdom	5	4	1
Germany	6	3	3
Austria	7	6	1
Luxembourg	8	13	-5
Belgium	9	10	-1
Ireland	10	11	-1
France	11	2	9
Slovenia	12	20	-8
Czechia	13	19	-6
Portugal	14	7	7
Estonia	15	18	-3
Latvia	16	26	-10
Spain	17	1	16



Malta	18	17	1
Italy	19	5	14
Cyprus	20	24	-4
SLOVAKIA	21	27	-6
Greece	22	12	10
Hungary	23	22	1
Lithuania	24	25	-1
Poland	25	22	3
Croatia	26	15	11
Bulgaria	27	21	6
Romania	28	28	0
			$\sum d_i^2$ <b>1543</b>

Source: Author's own based on EIS, 2018 and TTCI, 2017

The number of observations	$n = 28$
The sum of squared differences	$\sum d_i^2 = 1543$
Significance level	$\alpha = 0,05$
Critical value $r_0$	$r_0 = 0,375$

Spearman's correlation test between countries' innovative performance and competitiveness of tourism industry for 2017:

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2-1)} = 1 - \frac{6 \cdot 1543}{28(783)} = \mathbf{0,422}$$

Since  $r_s > r_0$ , we reject hypothesis 0 and accept hypothesis 1 and at significance level  $\alpha = 0.05$ , we claim that there is a positive correlation between the overall innovative performance of the countries and the position in the index of competitiveness of tourism industry. Based on the results of the implementation of the above-mentioned correlation method, we conclude that *the innovative background of the economy is a factor affecting the competitiveness of tourism industry*. The input data points to an example of a country that does not fit this conclusion. Spain is ranked among the countries considered to be the most competitive in the tourism industry, despite the fact that its innovative performance ranks it among the countries known as the Moderate Innovators. The quality of natural and cultural resources, transport infrastructure, tourist services, political priority, cultural resources and business tourism are the factors that eliminate the relatively weak stimulating effect of the innovative environment in the economy. From a sustainability perspective, however, the innovative environment of the economy is a key stimulus to the competitiveness of the sector. Labour productivity is one of the economic performance indicators in tourism industry services. The following part of the study implements the used statistical-mathematical method of correlation and regression analysis to verify the relationship between the innovative performance of the economy and labour productivity in tourism industry. This relationship is the subject of the hypothesis linked to research question 2: *Is the innovative performance of the EU economies a precondition for the economic performance of tourism industry?*

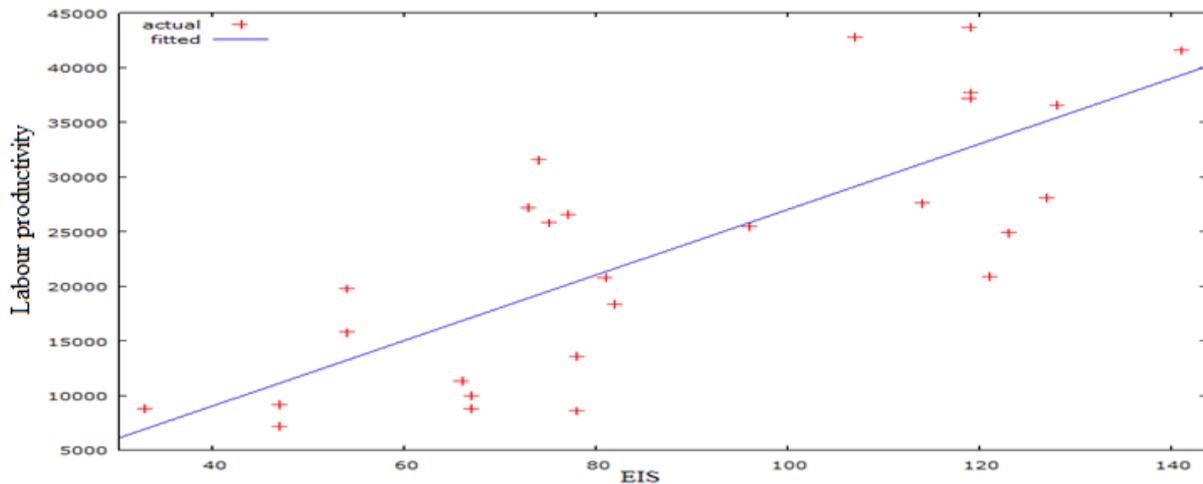
The question is answered by means of established hypotheses:

*H0: there is no link between the innovative performance of the economy and labour productivity in the tourism industry*

*H1: there is a link between the innovative performance of the economy and labour productivity in tourism the industry*

Graph 1 and Graph 2 show the results of the correlation and regression analysis performed. Graph 1 shows the relationship between innovative performance of the EU countries and labour productivity in economic activities of section I, Graph 2 shows the relationship between innovative performance of the EU countries and labour productivity in economic activities of division I55.

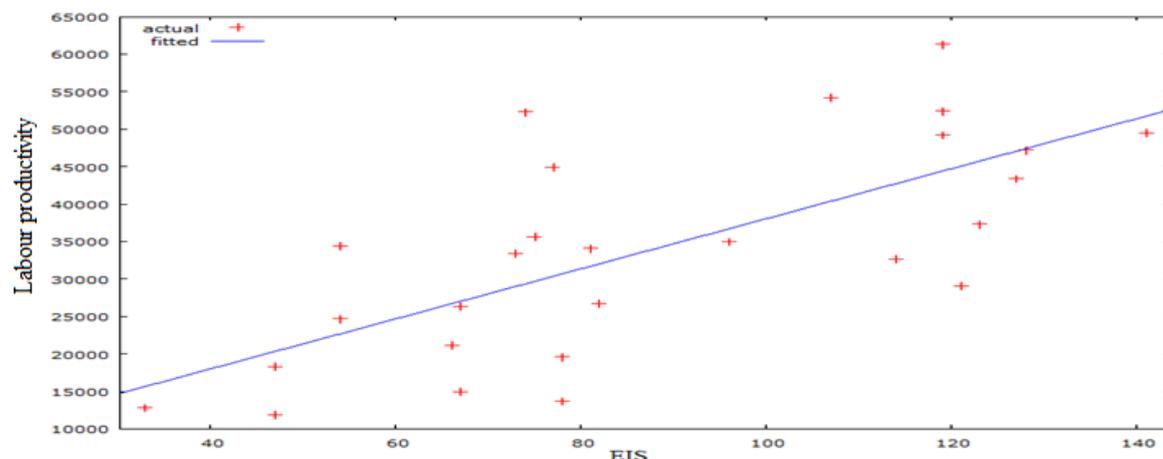
**Graph 1.** Relationship between innovative performance and labour productivity in the EU countries' tourism industry in 2017



Note: All 28 EU countries except Denmark due to inaccessibility of labour productivity data in 2017  
Source: Author's own based on EIS, 2018 and Eurostat

The results show a very high positive correlation between innovative performance and labour productivity in tourism industry in the EU countries in 2017. The correlation coefficient ( $r$ ) reaches 0.78, thus identifying a strong linear direct relationship between the monitored variables. The coefficient of determination (R-squared) is 0.60, 60% of data variability is explained by this regression model, the remaining 40% of the data are other factors and random effects not included in the model. The model is statistically significant ( $p$ -value is 0.0001), both the correlation coefficient and the regression line point to a direct linear relationship between the two variables.

**Graph 2:** Relationship between innovative performance and labour productivity in the EU countries' accommodation services in 2017



Note: All 28 EU countries except Denmark due to inaccessibility of labour productivity data in 2017  
Source: Author's own based on EIS, 2018 and Eurostat



The relationship between innovative performance and labour productivity in accommodation services of the EU countries shows a perfect positive dependence. This is supported by a correlation coefficient of 0.70, which indicates a strong direct linear relationship between the variables under review. The regression model explains 49% data variability, the other 51% are other factors and random effects not included in the model. The model is statistically significant with respect to a p-value of 0.0001.

It can thus be confidently stated that if the innovative performance of the economies of the EU countries increases, the labour productivity in the tourism industry increases as well. The innovative performance of the economy thus positively influences the performance in accommodation and catering services in section I as well as in the separately monitored division I55 accommodation services. Innovations generated and exploited in the economy of the country are also used by the enterprises operating in the tourism industry and by accommodation and catering facilities, regardless of the source of their origin. They create a more favourable business environment, the ability of those enterprises to remain competitive in the market and to be more efficient. Based on the analyses carried out, we accept hypothesis 1 and reject hypothesis 0. *Innovative performance of the EU economies can be described as a precondition for the economic performance of tourism industry.*

## Conclusion

The essence of the production of the services in the tourism industry reflects the consumer's strong position in the 'prosumer' position. Consumer input into the production of services affects its quality. On the other hand, the impact of the cross - cutting nature of the tourism industry on a product value chain puts pressure on the quality of inputs from various industries. The production of services in the tourism industry is therefore a complex mechanism. It responds to the needs of changing demand and copes with the market conditions of increasing technology, robotics and artificial intelligence. The production of services in the tourism industry is characterised by low production of new knowledge applicable in the wider economic environment. This corresponds to its low knowledge intensity. However, competitive pressure, sophistication of consumers, generational exchange of consumers, availability of information, technological pressure of the environment initiate innovative behaviour of the enterprises operating in the tourism industry. The result of this effect is an increasing range of use of innovations in those enterprises. These allow better consumer satisfaction, cost savings and increased performances. The article evaluates the impact of the innovative background of the economy on the tourism industry. The high-quality innovative background of the economy affects the penetration of innovations into the industry and thus the performance it achieves.

We perceive the innovative background of the economy as a synchronous existence of innovative culture, innovative potential and innovative performance in the economy. All these elements are part of the European Innovation Scoreboard (EIS) indicators. The assumption that the innovative background (indicated by innovative performance within the EIS) of the economy has a positive impact on the economic performance of the tourism industry and its competitiveness has been confirmed in our study. Based on the results of the implementation of the Spearman's rank correlation coefficient, we conclude that *the innovative background of the economy is a factor affecting the competitiveness of the tourism industry.* The use of Pearson's correlation coefficient and determination coefficient, points to a strong direct linear correlation between the innovative performance of the EU economies and labour productivity within the tourism industry. *Innovative performance of the EU economies can thus be pronounced as being a requirement and precondition for the economic performance of the tourism industry.*

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