THE ENVIRONMENTAL ASPECT OF TOURISM AND RECREATION ALSO AFFECTS THE VALUE OF RESIDENTIAL PROPERTIES

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Abstract

Recreation, as a phenomenon of modern life, encompasses diverse activities that provide escape and relaxation from everyday routine and work stress. This short-term leisure activity is often associated with travel to various locations, both nearby and distant, offering various forms of relaxation and entertainment. These activities include spa stays, beach vacations, but also active holidays involving outdoor sports, exploring new cultures, and environments.

Increased tourist traffic brings both positive and negative impacts to destinations. From an economic perspective, tourism can be a source of income for local businesses and contribute to the economic growth of the destination. However, the negative aspect is often associated with the strain on infrastructure, increased resource consumption, and environmental pollution.

In the context of property value, tourism can have a dual effect. On one hand, the attractiveness of the destination may increase residential property prices in the area, especially if it is considered a prestigious tourist spot. On the other hand, excessive tourist traffic may reduce attractiveness for potential residents due to issues such as noise, pollution, and overcrowding. The study focuses on evaluating this complex relationship between tourism and property value in a given location. The article presents the final results of the study and cohesively builds upon previously presented articles and partial findings.

Keywords: The impact on the environment, tourism, property value, determinants of pricing, tourist destinations.

Introduction

The analysis of the current state of knowledge indicates that tourism has been dynamically developing in the Czech Republic in recent years, excluding the SARS-CoV-2 virus epidemic in the years 2020-2022. In some locations, this sector has a significant impact on the value of real estate. Attention in the real estate market is primarily focused on the influence of tourism on the market value of recreational properties and accommodation facilities. It is evident that the value of these properties will be higher. Less attention is being paid to the impact of tourism on other types of properties, where this influence may be opposite. For example, a high number of visitors (tourists) can lead to traffic congestion, waste, air pollution, noise in surrounding areas, and similar issues. These negative consequences can then decrease the quality of life and the environment, as well as the value of properties. Tourism and associated travel, which can have both positive and negative impacts, can thus be considered as environmental externality affecting property value. The article presents the summary results of several studies conducted by the authors over a four-year period at the Institute of Forensic Engineering.

Materials and methods

Two most visited tourist locations were selected from each region across the Czech Republic, based on data from the Czech Statistical Office. For further analysis, data on residential property prices were obtained, specifically from realized sales prices of family houses and apartment units recorded in purchase agreements registered at the Czech Office of Surveying, Mapping and Cadastre. Simultaneously, statistical information on the volume and trends of tourism in specific locations and time periods was obtained from the Czech Statistical Office database. Due to being public databases managed by state institutions, the acquired data and their sources are considered reliable. This assessment underscores the importance of credibility and accessibility of information from public data sources for scientific research. The Czech Office of Surveying, Mapping and Cadastre has been mandatorily recording price data on realized sales since 2014, with older data unavailable. Consequently, databases of price data covering the period from 2014 to the present have been established. Parallel to this database, data on tourism are gathered and compiled from the public database of the Czech Statistical Office, specifically comprising time series relating to the development of tourism in the examined locations. For the analysis of the overall impact of tourism, data are used and evaluated only up to the year 2019, inclusive. The significant decrease in the

number of tourists in the years 2020-2021, caused by the COVID-19 pandemic, is statistically significant, and its inclusion in the model would distort the achieved results. This led to the decision to evaluate the overall data only for the period from 2014 to 2019, inclusive. In order to eliminate potential interferences that could affect the results of tourism impact, an additional analysis of another determinant was used, primarily the natural inflation of apartment units and family houses in the examined locations, respectively regions. To neutralize this effect, the House Price Index was used, which was again sourced from the database of the Czech Statistical Office. For the evaluation of the compiled databases, dependency analysis was used, especially its tools, correlation and regression analysis. All results were evaluated in the professional statistical program Stat graphic Centurion using regression modelling.

Results – statistically significant results

From our own solution and achieved results, locations where there is a statistically significant positive as well as negative impact of tourism on property value have been identified. In these locations, a higher degree of correlation between the number of tourists and property prices was mostly observed compared to the House Price Index (HPI), where this influence was either excluded or was at a minimum level, similar to or very close to the observed correlation. The results are clearly displayed in the following table.

Tab. 1: Statistically significant localities (Source: Own processing)

No.	Region	Location	Type of property	Correlation HPI vs. price	Correlation tourism vs. price	Influence	Coefficient of determination	P - value
1.	Jihočeský	Český Krumlov	House	0,904	0,960	Positive	93,16%	0,002
2.	Jihočeský	Český Krumlov	Flat	0,817	0,967	Positive	95,68%	0,001
3.	Jihočeský	Hluboká nad Vltavou	House	0,992	0,982	Positive	99,66%	0,000
4.	Jihočeský	Hluboká nad Vltavou	Flat	0,932	0,847	Positive	80,69%	0,015
5.	Jihomoravský	Lednice	Flat	0,880	0,925	Positive	89,95%	0,004
6.	Jihomoravský	Mikulov	House	0,924	0,973	Positive	96,01%	0,001
7.	Jihomoravský	Mikulov	Flat	0,990	0,974	Positive	96,27%	0,001
8.	Jihomoravský	Znojmo	House	0,903	0,913	Positive	85,19%	0,009
9.	Jihomoravský	Znojmo	Flat	0,955	0,991	Positive	98,54%	0,000
10.	Karlovarský	Karlovy Vary	Flat	0,902	0,928	Positive	86,87%	0,007
11.	Karlovarský	Loket	Flat	0,548	0,846	Positive	74,89%	0,026
12.	Vysočina	Jihlava	Flat	0,989	0,946	Positive	94,23%	0,001
13.	Vysočina	Pelhřimov	Flat	0,984	0,865	Positive	78,62%	0,019
14.	Vysočina	Telč	House	0,636	0,851	Positive	77,04%	0,022
15.	Královéhradecký	Dvůr Králové	Flat	0,954	0,965	Positive	95,29%	0,001
16.	Královéhradecký	Jíčín	Flat	0,897	0,786	Positive	67,69%	0,044
17.	Liberecký	Frýdlant	House	0,918	0,992	Positive	98,65%	0,000
18.	Liberecký	Frýdlant	Flat	0,973	0,955	Positive	93,71%	0,000
19.	Liberecký	Liberec	Flat	0,907	0,883	Positive	86,30%	0,007
20.	Olomoucký	Šumperk	Flat	0,980	0,979	Positive	96,51%	0,001
21.	Plzeňský	Klatovy	Flat	0,977	0,796	Positive	68,87%	0,041
22.	Plzeňský	Tachov	Flat	0,991	0,781	Positive	70,69%	0,036
23.	Ústecký	Děčín	Flat	0,972	0,948	Positive	92,82%	0,002
24.	Ústecký	Ústí nad Labem	House	0,770	0,813	Positive	68,89%	0,041
25.	Ústecký	Ústí nad Labem	Flat	0,968	0,791	Positive	70,72%	0,036
26.	Zlínský	Rožnov	Flat	0,984	0,868	Positive	81,48%	0,014
27.	Zlínský	Vizovice	Flat	0,741	-0,894	Negative	85,13%	0,009

The p-value in regression analysis expresses the probability of obtaining the observed data if the null hypothesis were true. Furthermore, in this analysis, the null hypothesis that there is no relationship between the independent (or independent) and dependent variables is often tested, which would mean that the coefficients of the regression model are zero.

If the *p-value* is low (for example, less than 0.05 when testing at a 95% confidence level), the null hypothesis is typically rejected, indicating that there is a statistically significant relationship between the independent (or independents) and dependent variables. If the p-value is high, the null hypothesis is not rejected, suggesting that there is insufficient evidence to assume a significant relationship. Thus, the p-value is an important indicator of statistical significance in regression analysis and helps determine whether the analysis results are statistically significant.

The coefficient of determination (also known as R-squared) in regression analysis is a statistical measure that expresses how well the regression model explains the variability of the dependent variable compared to the mean value of the dependent variable. In practice, the R-squared value is typically interpreted such that, for example, a value of 0.70 would mean that 70% of the variability of the dependent variable is explained by the regression model, while the remaining 30% of variability remains unexplained and may be caused by other factors.

Results – statistically insignificant results
The following table presents the locations where statistically insignificant results were obtained, i.e., locations where the influence of tourism on property value was not demonstrated.

Tab. 2: Statistically insignificant localities (Source: Own processing)

No.	Region	Location	Type of property	Correlation HPI vs. price	Correlation tourism vs. price	Influence	Coefficient of determination	P - value
1.	Jihomoravský	Lednice	House	0,931	0,446	Positive	22,25%	0,345
2.	Jihomoravský	Valtice	House	0,867	0,511	Positive	31,94%	0,243
3.	Jihomoravský	Valtice	Flat	0,964	0,451	Positive	26,92%	0,292
4.	Jihomoravský	Vranov nad Dyjí	House	0,036	0,405	Positive	16,91%	0,418
5.	Karlovarský	Karlovy Vary	House	0,536	0,576	Positive	39,62%	0,181
6.	Karlovarský	Loket	House	0,275	0,336	Positive	13,28%	0,478
7.	Vysočina	Jihlava	House	0,675	0,506	Positive	37,87%	0,193
8.	Vysočina	Pelhřimov	House	0,880	0,512	Positive	28,56%	0,275
9.	Vysočina	Vysočina	Flat	0,809	0,604	Positive	41,11%	0,170
10.	Královéhradecký	Dvůr Králové	House	0,819	0,570	Positive	34,66%	0,219
11.	Královéhradecký	Jíčín	House	0,173	-0,425	Negative	24,24%	0,321
12.	Liberecký	Liberec	House	0,337	0,375	Positive	22,94%	0,337
13.	Olomoucký	Litovel	House	0,453	0,577	Positive	35,05%	0,216
14.	Olomoucký	Litovel	Flat	0,840	0,432	Positive	42,58%	0,160
15.	Olomoucký	Šternberk	House	-0,447	-0,041	Negative	0,37%	0,909
16.	Olomoucký	Šternberk	Flat	0,995	0,655	Positive	47,28%	0,131
17.	Olomoucký	Šumperk	House	0,452	0,610	Positive	46,80%	0,134
18.	Plzeňský	Klatovy	House	-0,159	0,169	Positive	6,31%	0,631
19.	Plzeňský	Tachov	House	0,754	0,599	Positive	41,15%	0,170
20.	Plzeňský	Železná Ruda	House	0,639	0,771	Positive	62,14%	0,063
21.	Plzeňský	Železná Ruda	Flat	0,880	0,779	Positive	64,79%	0,053
22.	Ústecký	Děčín	House	-0,689	-0,623	Negativní	42,09%	0,163
23.	Zlínský	Luhačovice	House	0,549	-0,011	Negative	0,27%	0,922
24.	Zlínský	Luhačovice	Flat	0,811	-0,349	Negative	14,19%	0,462
25.	Zlínský	Rožnov	House	0,489	0,335	Positive	12,33%	0,495
26.	Zlínský	Vizovice	House	0,807	-0,496	Negative	35,86%	0,209

Discussion

The aim of the studies was to evaluate the impact of tourism on the value of residential properties. In 27 locations, a statistically significant influence of tourism on the value of family houses and apartment units was observed, while in 26 locations, this influence was statistically insignificant. However, it is important to consider possible reasons for this discrepancy. One possible explanation for the mixed results could be the evaluation of a relatively short time series. The Czech Office of Surveying, Mapping and Cadastre records price data from 2014 to the present. However, the outbreak of the SARS-CoV-2 virus in 2020 led to a halt in tourist activities for almost two years. As a result, the data were evaluated only for the period between 2014 and 2019. The short-term nature of the data may have limited the ability to capture the full extent of the relationship between tourism and property value over time.

It is also necessary to note that although the authors of the studies attempted to assess similar, or comparable, locations, not every tourist-attractive location is identical. Another explanation for the differing impact of tourism in statistically significant and insignificant locations may therefore be related to the varying characteristics of these locations and variables that were not included in the analysis.

Differential tourist attractiveness: Locations with a significant impact of tourism may have a more pronounced tourist attractiveness than others. For instance, a location with popular landmarks, natural beauty spots, or cultural events could be more appealing to a larger number of tourists, which could also manifest in a statistically significant impact on property value.

Differential infrastructure and services: Locations with a higher level of tourist infrastructure and accessibility of services for tourists, such as hotels, restaurants, or recreational activities, may better leverage the economic benefits of tourism, which would also be reflected in the property value.

Variability in price growth: Locations with different levels of property price growth may exhibit varying impacts of tourism. If property prices in statistically significant locations were consistently higher than in other locations during the study period, it may indicate a stronger link between tourist demand and property prices. However, this would require a more comprehensive study involving more locations, including those less touristy, and a comparative analysis based on the results obtained.

Geographic and economic factors: Other factors may include the geographic and economic characteristics of individual locations, such as transportation accessibility, unemployment rate, or the presence of other economic sectors beyond the tourism industry, which may influence the real estate market. These additional factors may explain the differential impact of tourism on property value in various locations and contribute to the variability of analysis results. Further research, encompassing a longer time series, including both pre- and post-pandemic periods, could provide a more comprehensive insight into the relationship between tourism and property value. Additionally, investigating other potential factors, such as local economic conditions and government policies, could help clarify the complex dynamics occurring among the variables under study.

Conclusion

In conclusion, the study results offer valuable insights into the field of real estate valuation, specifically addressing one of the potential value-creating factors that may affect residential property value. They shed light on the relationship between tourism and the price value of residential properties. The aim of the studies is to quantify, elucidate, and evaluate this relatively underexplored aspect, namely the impact of tourism, which can influence property value. Subsequently, based on the achieved results, the search for a suitable approach in potential implementation into valuation methods ensues. Scientific methods of dependency analysis, particularly correlation and regression analysis, have been successfully utilized to identify and quantify the interrelationships.

References

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Acknowledgement

Souhrn

Ve všech studiích byly použité metody a postupy aplikovány na věci nemovité s rezidenční funkcí, konkrétně na bytové jednoty a rodinné domy. Avšak časový rámec, ve kterém byl vliv turistiky na hodnotu těchto nemovitostí zkoumán, byl omezen, a to jak z hlediska cenových údajů, které

katastrální úřad eviduje od roku 2014 po současnost, stejně tak faktorem viru Sars-CoV-2, který v roce 2020 a následujícím, zásadně ovlivnil a téměř na dva roky zastavil turistickou aktivitu. Z tohoto důvodu bylo možné zkoumat pouze omezené časové období. Pro budoucí výzkum by bylo vhodné a přínosné posuzovat delší časové období, do kterého nezasáhne statisticky významný vliv další proměnné, jako například již zmíněný vir Sars-CoV-2 nebo jiná abnormalita. Při zkoumání a vyhodnocování delšího časového období, bez těchto interferencí, by jistě byly výsledky těchto studií důraznější, statisticky významnější a přesnější.

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