Analysis of the impact of selected variables on the availability of accommodation facilities

Klára Václavinková ¹, Milena Botlíková ², Miroslava Kostková ³

Abstract. One of the evaluation criteria of success of tourism destinations are the outputs of accommodation facilities for tourism, it is the availability of accommodation facilities. Statistical data helps assess not only the domestic availability, as well as foreign participants. The subject of investigation will be the evaluation criteria in terms of occupancy residents and not residents. The actual criterion is influenced by many factors, such as substitution, crime, the amount of disposable income of the population of the CZ, etc. However, these effects have an impact not only on the level of demand of the accommodation, but also affect the selection of categories (hotels, cottages, campsites). Organizations providing services in the tourism sector, especially housing, creates incentives to accelerate the development of other sectors (trade, transport infrastructure, construction and others). These indicators are very sensitive to economic fluctuations. Any analysis will allow for the cross-sectional statistical data to establish relationships and dependencies of these quantities. The result will be the definition of needs for further development and the ability to create tools for improving these services.

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1 Introduction

In the last years, the development of tourism. Tourism is the main sectors involved in the economic development of the country, but it also has meaning. Not only is an important component of foreign trade in recent years to create a positive balance, creating working conditions not only in the travel industry, but also associated industries. The development of tourism is needed lately to pay attention to tourism through the implemented residents (It is estimated that with jobs in tourism tied 6-8 jobs tied to tourism). Tourism development has since 2004 fluctuating trend

Negative effects caused in the tourism market growth in supply over demand, which creates pressures to reduce prices, which may be beneficial for many companies liquidation. To maintain and attract a customer tries to individual facilities creating different types of promotions from various pricing advantage, service packages and other incentives. The problem is that the menu structure and targeting specific audiences is correct.

One of the possible causes of the decline in tourism can be caused due to:
- safety in the locality,
- environmental load, disaster,
- economic situation, price,
- legislative restrictions,
- standards of service.

Criteria for assessment of the situation in the tourism sector are the numbers of each occupancy accommodation or overnight stays. Accommodation facilities in the CZ since 2010 are classified according to a common European system, which integrates the services provided by businesses, facilities, and other criteria. Individual property is divided into hotels 1 to 4 three star hotels, motels and guest houses, camps and other cottage. European system classification works under the auspices of the Union Hotel Stars, owned by the Association of Hotels and Restaurants, hotels have classified this way to gain a competitive advantage such as promotion in all coun-

¹ Silesian University in Opava, department of Tourism Univerzitní nám. 1934/3, 733 40  Karviná, Czech Republic, vaclavinkova@opf.slu.cz
² Silesian University in Opava, School of Business Administration in Karvina, department of Logistics, Univerzitní nám. 1934/3, 733 40  Karviná, Czech Republic, botlikova@opf.slu.cz.
³ Silesian University in Opava, department of Tourism Univerzitní nám. 1934/3, 733 40  Karviná, Czech Republic, kostkova@opf.slu.cz.
tries registered in the system. Categorization for statistical surveys of the CSO then defines Hotels 4 and 3 star hotels, guesthouses, campsites, cottages and cottage settlements and others.

Current situation in tourism is associated with the crisis period, although the crisis was the cause of the collapse in demand for accommodation in 2008-2009, fluctuating trends have been observed since 2004, as evidenced by changes in the number of residents in each guest accommodation. If we came out of the above, then, if safety and environmental load cannot be assumed reasons for reducing the demand for accommodation. CZ does not deal with other countries such as riots, strikes and is not associated with any serious environmental or natural disasters. The problem might seem economical and social situation of residents and standards of service.

The assumption is that domestic tourism will be bound to the exchange rate is correct. Number of residents in 2006 and 2007 the upward trend. Exchange rates at the time declined to strengthen the crown.

Figure 1 Development of the number of guests and residents of the development of UDS and the euro exchange rate [1]

1.1 Factors affecting interest in tourism

Evaluate the success of tourism is possible in the number of guests and overnight stays in different categories. Our goal is to determine what factors act on the selection of different types of accommodation. As described above for the decline in tourism can affect economic and social situation of residents exchange rates of CZK against the euro or dollar, or safety

In determining the occupancy dependence of individual accommodation facilities and exchange rate value of each course were recalculated on the basis of the values observed rate of the Czech National Bank (as the value of 2 consecutive, excluding weekend days) and converted to values of the quarter or annual averages, so that they are compatible with value for the number of guests for the period, overnight. The values of CZ and unemployment data on safety, based on the values of the Czech Statistical Office (CSO) [1].

1.2 Finding a suitable model

The evaluation will be based variable number of variables in each guest accommodation establishments regressors individual factors that are, according to the above-mentioned possible causes of the decline in tourism:

• the average wage,
• unemployment,
• rate CZK / EUR,
• CZK / USD exchange.

We use multiple regression model to determine the dependence between the variables.

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots \]

The dependence between the number of guests in each accommodation and individual factors.

The regression model (1) was determined on the basis of explored values of guests of "*****" hotels and salary:

\[ HOTEL 5* = -100.251 + 26.25 * pay \]  \hspace{1cm} (1)
The following values indicate that the regression model is chosen correctly. The coefficient of determination \( R^2 = 0.51 \), which indicates what proportion of the variance in the dependent variable observations. Regression was able to explain. Use the \( R^2 \) measure described tightness depending regression functions. The larger the value of \( R^2 \), ie value approaching to 1, the mean regression greater success and vice versa [5]. At the same time the value of the parameter \( \beta_1 = 2.44 \times 10^{-7} \) shows the significance factor wages (see Table 1).

\[
\text{Table 1 MS Excel regression analysis}
\]

For better explanation of the regression model will be examined in relationship to the unemployment figures. We assume that the unemployed persons, the accommodation of disinterest. The reason for this postponement is high and unnecessary financial costs. After inclusion of the variable unemployment there was a small increase in \( R^2 = 0.508617 \), \( \beta_1 = 0.872609 \) Parameter is insignificant, so it disposés of the variables.

Another variable regression model for improvement is to use the exchange rate CZK / EUR. We assume that both residents and nonresidents will move according to prefer accommodation at home or abroad. Again, there was only a slight improvement in the coefficient of determination \( R^2 = 0.50965 \), for reasons of immateriality parameter \( \beta_1 = 0.749225 \) is the elimination of variable exchange rate CZK / EUR.

Also, the variable exchange rate CZK / USD showed little growth and the insignificance of the parameter \( \beta_1 \), you see Table 2.

\[
\text{Table 2 MS Excel regression analysis}
\]

The final model of the relationship between the number of guests and the average wage in the CZ expresses the model (1).

\[
\text{HOTEL 4*} = -1 809 \ 144.35 \ + \ 176.69 \ \mathrm{pay}
\]  

(2)
The value of coefficient of determination is sufficient enough and the model explains the dependence of data. As in previous cases, the regression model improved by gradually adding the variables of unemployment and exchange rates. Based on the values of Table 4 the variable from the model excluded employment, the parameter $\beta_1 = 0.916166$.

For complete model of exchange rate CZK / EUR was a slight improvement in the coefficient of determination $R^2 = 0.764326$, and the parameter is statistically significant because the variable is included and the model will have the form (3) $sp$ - value for $\beta_1 0.047701$ and $p$ - value for $\beta_2 0.012657$.

Also refine the model using a variable exchange rate CZK / USD for the coefficient of determination was increased to 0.773751. There was, however, for including this variable in the regression model, the parameter is $\beta_1$.
appears to be statistically insignificant (p-rank of the individual t-test 0.228691). Factor CZK / USD will be removed for reasons multicollinearity (CZK / EUR and CZK / UDS correlation coefficient 0.872949038).

Regressive model of dependence between factors will have the form (see Table 5):

\[ \text{HOTEL} \ 4^* = 3625 \ 649 + 81.68 \ \text{pay} - 12 \ 465 \ \text{CZK} / \ \text{EUR} \]  \hspace{1cm} (3)

The evaluation of the relationship between the number of guests in hotels and other wages were created model (4, see Table 6). Given the very low leakage, \( R^2 = 0.155951 \) is needed to improve the model by adding another variable.

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\begin{array}{cccccc}
\text{RESULT} & \text{Regression statistics} \\
& \text{Correlation coefficient } R & 0.394906 \\
& \text{The coefficient determination } R^2 & 0.155951 \\
& \text{Adjusting coefficient determination } R^2 & 0.133793 \\
& \text{Error mean} & 600495 \ 599773 \\
& \text{Observation} & 40 \\
\hline
\text{ANVA} & \text{Unlike} & SS & MS & F & \text{Significance } F \\
\hline
\text{Regression} & 1 & 2.531769 \times 10^12 & 2.531768 \times 10^12 & 7.021087 & 0.011674 \\
\text{Residues} & 38 & 1.370261 \times 10^13 & 3.605905 \times 10^11 & & \\
\text{Total} & 39 & 1.6234377 \times 10^13 & & & \\
\hline
\text{Coefficients} & \text{Error mean} & t \text{Stat} & p \text{Value} & \text{Low 95%} & \text{Up 95%} \\
\hline
\text{pay} & -77.440539 & 29.225786 & -2.649733 & 0.01674 & -136.605049 & -18.276030 \\
\end{array}
\]

Table 6 MS Excel regression analysis

\[ \text{HOTEL} \ \text{next} = 4 \ 859 \ 967 - 77.4405 \ * \ \text{pay} \]  \hspace{1cm} (4)

In determining the dependencies between variables unemployment and unemployment reached a value of regression model \( R^2 = 0.218232 \ \text{(adj } R^2 = 0.175974) \), where p-value of the individual t-test parameter \( \beta_1 = 0.0943 \) factor will be excluded from the model unemployment. Inclusion of the exchange rate CZK / EUR with values \( R^2 = 0.230027 \ \text{(adj } R^2 = 0.188407 \) and the value of the parameter \( \beta_1 = 0.0676 \) and the exchange rate CZK / USD with the values of \( R^2 = 0.196826 \ \text{(adj } R^2 = 0.153412 \) and value of the parameter \( \beta_1 = 0.1478255 \) was elimination of the variables from the regression model and the dependence between the number of guests in hotels and other individual variables has the form (3)

Rating based on number of guests in boarding houses will be a factor in wage determination coefficient values of 0.46660 (adj. \( R^2 = 0.4423 \) with the \( \beta_1 1.7619 \ E-06 \) included in the model, which will have the form:

\[ \text{HOTEL} \ \text{Boarding} = 2 \ 200 \ 971.1 - 62.12 \ * \ \text{pay} \]  \hspace{1cm} (5)

Unemployment has been added to the model in order to improve its quality. This variable was also included in the model (\( R^2 = 0.482938 \), p - parameter value 0.17807 \( \beta_1 \), appears as a parameter statistically insignificant. To further improve the model variables were gradually added in the case of exchange rate CZK / EUR was to create a model with the values of \( R^2 = 0.5743 \ \text{(R2 adj = 0.5513)} \) and p - values for the parameters \( \beta_1 = 0.0000027 \) and \( \beta_2 = 0.002827 \) has the form (Table 7):

\[ \text{HOTEL} \ \text{Boarding} = 6 \ 138 \ 606.28 - 130.96 \ * \ \text{pay} - 90 \ 314.42 \ * \ \text{CZK} / \ \text{EUR} \]  \hspace{1cm} (6)

Adding the values of the variable CZK / USD has been improvement in the coefficient of determination, p - values for each parameter, they are statistically significant variables CZK / EUR and CZK / UDS, however, exhibit multicollinearity (correlation coefficient 0.872) and therefore the variable CZK / USD disabled regression model and linear model relationship will have the form (6)
This regression function was then examined in terms of heteroscedasticity using the Spearman correlation test sequence, using the Durbin-Watson test was examined first order autocorrelation. In both cases, the function appears to be satisfactory. The perimeter of the regression function is also well suited in multicollinearity.

**Conclusion**

As of model creation is evident in all models is lower or higher dependence on number of guests in accommodation establishments analyzed individually to pay. Probably the amount of income affects the choice of quality hotel accommodation. Already Lim (1997) confirmed in their study of tourism demand model, showed that economic factors such as income, relative prices, transportation costs and exchange rates are key factors in tourism demand [4].

In case of increase in wages only by CZK 1 occurs in 5 star hotels increased by 26 guests. In contrast, other hotels in unit wage increase causes a decrease of 77 non resident guests.

If the number of guests at hotels and guest houses 4 star depends not only on wages but also on the CZK / EUR. With the increase in wages and also to increase the exchange rate if there is a 4 star hotel to a decline in the number of guests in the case of pensions is similar.

The model shows that the movement of wages guests respond by changing preferences on the level of housing services and look for when a better salary as a stimulus for the use of a higher category of accommodation services. Increased exchange rate (devaluation of the Czech crown) can change the preferences of foreign guests, ie, increasing demand for higher categories of accommodation facilities.

**References**


