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# Marketing in the spa industry: How does marketing affect the performance of spa businesses in Slovakia?

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## Abstract

This research delves into the influence of marketing on the performance of spa businesses in Slovakia, a sector with a rich historical background and significant potential for growth. This study aims to examine the role of marketing in the spa industry in Slovakia and its impact on the performance of selected spa businesses. This study utilizes regression analysis in statistical software R to assess financial data from twenty-five spa businesses in Slovakia spanning from 2012 to 2022 comprising 198 data points. In addition, the study investigates the use of social media platforms in spa marketing by examining the online communication practices of selected Slovak spa businesses and their international counterparts. The results indicate that although the use of social media in the marketing strategies of Slovak spa businesses is currently limited, marketing expenditures significantly influence the sales of these businesses. This highlights the potential for improved performance through more strategic marketing, particularly digital channels. The limitation of this study is the availability of statistical data in the environment of spa businesses in Slovakia which significantly limits the results of the study. The findings emphasize the importance of effective marketing implementation in the Slovak spa industry with a specific focus on the necessity for increased digitization and the use of social media platforms. This insight is essential for spa businesses seeking to optimize their marketing efforts and enhance overall business performance.

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## 1. Introduction

Many effects are attributed to tourism marketing. Studies focused on this area confirm the positive effects of marketing on client relations and the growth of traffic in the destination. Subsequently, there is an increase in the economic performance of tourism businesses and the growth of regional and national economies [1-3]. Marketing is also a source of necessary data on consumption. These are used to personalize products [4]. The favourable effects of marketing activities are also documented to a lesser extent in the environment of spa tourism. Marketing in the spa industry increases the competitiveness of businesses despite the insufficiently covered research space [5].

In the tourism industry, conventional marketing tools are being supplanted by digital tools. Presently, marketing strategies in the tourism sector are being significantly influenced by clients who are widely regarded as opinion leaders in digital marketing platforms and social networks. It is part of corporate and destination marketing strategies in tourism. Research shows the effectiveness of social media influencer activities on the active involvement of tourists in marketing campaigns [6]. The theory and practice of tourism marketing are moving into the space of virtual reality as a prospective marketing tool with higher effectiveness than traditional media [7]. However, research in this area is only in its infancy and the results suggest future marketing strategies in the meta-version focused on experiences and changing consumer behaviour in the tourism industry [8]. The development of marketing in the tourism industry is significantly influenced by digitalization; it is very dynamic and offers wide possibilities. However, the practice of spa tourism confirms the shortcomings of its use in spa destinations [9]. Searching for the most effective tools and the possibilities of their use in the practice of tourism marketing is therefore a challenge. The starting point is monitoring the effectiveness and efficiency of marketing.

The effectiveness of marketing is addressed to a limited extent within the tourism industry. Observations mainly focus on the effectiveness and effects that marketing activities bring while they take different forms. They are mainly product sales, number of visitors and tourists, number of recommendations on social networks, number of visitors through social media, increase in awareness of the destination and improvement of the destination's image [10-13]. The authors recognize consumer attitudes [14] and client loyalty [15] as significant indicators of advertising effectiveness.

The economic efficiency and performance of spa enterprises in the Slovak Republic have been analyzed by various studies Cabinova et al. [16], Čabinová et al. [17] and Štefko et al. [18]. The use of financial metrics to determine the effectiveness of marketing activities is recognized in a study from the Slovak hotel industry where the authors used Return on Investment (ROI) [19]. However, the concentration on expressing the effectiveness of marketing activities in the environment of Slovak spa companies is absent.

Following this research, this paper presents the results of an analysis of marketing impact on performance in conditions of Slovak spas. This application area is only poorly covered so far, even though the Slovak spa industry is a very promising form of tourism in the European context due to its infrastructural and supra-structural potential [20]. The attractiveness of the spa industry in Slovakia is evidenced by the positive trends in the number of visitors from both domestic and foreign clients as well as the rising trend of self-payers in the overall demand. In 2019, the occupancy of permanent beds in spa establishments in Slovakia was at the level of 69.2 % [21, 22]. There is room for improvement that will ensure a better result despite the rising occupancy of beds in spa establishments. One of the key means to achieve this is to market effectively. Spa businesses that focus primarily on the measurement and evaluation of the effectiveness of marketing communications will have a strong competitive position [23]. However, only some spa businesses use marketing communication effectively to gain a strong competitive position on the market [24].

This research study aims to examine and analyze marketing strategies within Slovak spa businesses thoroughly. The primary goal is to assess the effectiveness of various marketing activities and to determine their impact on the overall performance of these businesses in Slovakia.

## 2. Literature Review

Social media has become a crucial tool for spa businesses to promote their services. It is considered the most important marketing strategy that helps increase customer loyalty [25]. Although there are some drawbacks associated with using social networks for marketing spa businesses, the benefits outweigh the disadvantages [26]. The authors' attention is focused on the effectiveness and efficiency of marketing communication with the development of digitization and the use of social media. The power of the client in tourism and the specific characteristics of the product (inseparability, intangibility, transience and variability) support the importance of marketing communication in the whole set of marketing elements and activities. The goal of marketing communication is to stimulate sales and contribute to the long-term profit of the company [27]. Digital marketing communication is a platform for obtaining valuable data about clients which influences all components of the marketing mix. The essence of marketing communication is to influence the purchasing behaviour of customers to sell company products [28, 29]. Spa tourism clients tend to use social networks in the pre-purchase, purchase, and post-purchase phases of the business relationship [30].

Kaur [31] states that social networks enable a better understanding of customers and potential customers and their preferences for products and services. Generations of young people referred to as Generation Z are looking for travel inspiration through various channels which include the platforms Facebook, YouTube and Instagram [2]. Marketing communication through social networks increases the interest of potential clients in purchasing a service and reduces marketing costs for tourism businesses [32]. Communication on social networks is more credible to clients than promoting a tourism business in traditional media such as television, radio, newspapers and magazines [33]. Social media influencer marketing increases tourism business sales faster and more effectively than posts sponsored through marketing businesses [34]. Communication and promotion of events, products and services through social networks brings an increased number

of product purchases, an increase in traffic and a greater interest of potential clients in visiting and purchasing services in a tourism business. A higher number of followers on social networks means for businesses improved brand awareness and client loyalty which brings more long-term profit and client loyalty to use the services of a given tourism business [35]. Das [36] reports that investments in innovative digital marketing tools have given tourism businesses a 2.8x increase in sales and improved Return on investment (ROI) by up to 300 %. Therefore, we also focused on monitoring the use of social networks in the marketing of spa businesses in Slovakia. We set the research question as follows:

RQ1: What is the use of social networks in the marketing of spa businesses in Slovakia?

Effective marketing implementation is a crucial factor that determines the performance of businesses in the tourism industry. Mavondo et al. [37] have shown that effective marketing can have a positive impact on the financial performance of businesses resulting in an increase in market share, sales, gross margin, and successful new product launches.

Businesses can achieve increased revenues and sales by effectively implementing marketing communication [38]. Spa managers evaluate the effectiveness of marketing communication to optimize expenses and achieve short-term and long-term results. Short-term improvements include profits while long-term improvements reflect an improvement in brand value and image in the minds of customers [39]. Effective marketing communication leads to increased attendance, occupancy and sales of goods and services in the tourism industry. Moreover, it enhances the competitiveness of businesses and increases brand awareness [40, 41]. Several studies of the effects of marketing in the tourism industry prove their existence in the field of attendance at the corporate, regional, and national level. It is related to the effect of marketing activities within destination marketing [1]. Increased attendance is a source of increased economic effects and employment. Sofronov [2] states that tourism marketing increases the growth of local and national economies worldwide. It affects the attendance of tourism businesses and increases their sales. In addition to the mentioned effects, Avdia [3] recognizes the influence of marketing in the tourism industry on the technological development of the country. He attributes to marketing the increased number of tourists in Albania (from 3,673,000 in 2014 to 5,927,000 in 2018), increased number of employees, growth of the country's gross domestic product, increased number of accommodation facilities and increased income from tourism (by 48 % compared to 2017 and 2018) [3]. Marketing in tourism is also important from the point of view of generating consumption data. These are used to support sales based on analysis and price adjustment, forecasting sales and future customer needs [4]. The impact of marketing is noticeable when building the brand of businesses in the tourism industry. Marketing increases brand awareness contributing to greater visitor interest. Several tourism businesses use marketing activities that are based on reducing service prices, thereby threatening the brand of the business and creating a sense of instability and confusion among visitors [42]. Chongsitjiphol and Wongmonta [5] recognize the positive impact of marketing on increasing the competitiveness of spa businesses, increasing interest in spa services and improving customer relations. They state that if marketing is implemented correctly, it can bring about innovations that help the company to continuously build its brand and improve its position in the market.

Spa businesses and tourism businesses use modern technologies but with relatively low efficiency. The costs of marketing communication are often high for spa businesses which cause a lack of interest in the implementation of modern communication systems. It causes a problem to increase the number of visitors in accommodation facilities and clients using spa services [43]. De Pelsmacker et al. [44] state that spa businesses tend to use outdated marketing tools or rely only on clientele from health insurance companies. Health insurance businesses are also key partners for Slovak spas. Therefore, insufficient use of digital marketing can be a fact in their marketing practice as well. Marčeková et al. [24] point out that spa businesses in Slovakia use their websites and social platforms to communicate with the online environment.

Many spa businesses receive both positive and negative reviews, yet they often lack systematic management of these reviews, including standardized procedures and the necessary technologies for effective online reputation management. According to a study by Ďaďová and Soviar [45], businesses in Slovakia's tourism sector actively engage in online marketing communication. Their research reveals that tourism companies use online marketing strategies to promote their services with those collaborating with influencers and leveraging the social network Facebook experiencing the greatest increase in traffic. This emphasizes the significant impact of social media and influencer partnerships on improving business visibility and engagement. Ianina [9] states that Russian spa businesses and balneology centres do not use digital media and marketing effectively in their marketing communication which causes them to lose sales of services and products. The result is a decline in consumer interest due to a lack of information about the various benefits of their products. A similar opinion is also confirmed in the Slovak spa industry [24]. The results of a study focused on the effectiveness of digital technologies in marketing communication [46] also recognize the insufficient marketing communication of tourism businesses. The authors used the results of a primary survey which confirmed a significant increase in traffic in the tourism industry after the start of digital marketing of businesses on social networks.

The findings presented seem to be somewhat inconsistent. Although some studies indicate that marketing improves the success of tourism-related businesses, others cast doubt on its efficacy, particularly regarding digital marketing strategies used in the travel and spa sector. The aim of this research is to investigate how marketing expenses impact the performance of spa businesses in Slovakia. The necessity for the effective management of marketing activities with a particular emphasis on digital communication is robustly supported by the outcome. We set the following research question:

RQ2: How do the marketing costs of spa businesses in Slovakia affect their sales?

## 3. Methods

The methodological part of the paper is aimed at presenting some specific questions related to the ordinary linear models and the role of these models as a tool in the analysis of financial data in the spa businesses. The main emphasis is placed on the definition, interpretation and presentation of the properties and limitations of these models which are related

not only to the estimation of the parameters but also to the estimation of the vector of expected values of the dependent variable, hypothesis testing and investigating the intensity of the relationship between the dependent and independent variables.

### *3.1. Ordinary Linear Models (OLMs)*

The goal of our effort will be to explain the variability of the random variable $Y$ (dependent variable) by the dependence of its expected value on one or more non-random independent variables or regressors using ordinary linear models (OLMs).

Suppose that the relationship between the random variable $Y$ and the $k$ explanatory variables $X_j, j = 1,2, \dots, k$ can be formally expressed in the analytical form that is typical for a linear regression model as follows:

$$y_i = \beta_0 + \beta_1 \cdot x_{i1} + \beta_2 \cdot x_{i2} + \cdots + \beta_k \cdot x_{ik} + \varepsilon_i, \quad i = 1,2, \dots, n \qquad (1)$$

We can equally express relation (1) in matrix notation.

$$\mathrm{y} = \mathrm{X}\beta + \varepsilon \qquad (2)$$

While individual matrices or vectors are

$\mathrm{y} - n \times 1$ column vector of observations on the dependent variable.

$\mathrm{X} - n \times (k+1)$ matrix where we have observations on $k$ independent variables for $n$ observations.

$\beta - \ k+1$ column vector of unknown and fixed parameters of the model.

$\varepsilon - \ n \times 1$ column vector of disturbances or errors.

The regression model formally defined by relations (1) and (2) must satisfy the assumptions where$\mathrm{E}(\varepsilon_i) = 0$, $\mathrm{var}(\varepsilon_i) = \sigma^2 < \infty$, $\mathrm{var}(\varepsilon_i, \varepsilon_j) = 0$, where $\varepsilon_i \neq \varepsilon_j$ a $h(\mathrm{X}) \leq n$ [52]. If these assumptions of ordinary linear models (OLMs) are met, then for the dependent variable it holds that $\eta = \mathrm{E}(\mathrm{y}|\mathrm{X}) = \mathrm{X}\beta$, $\Sigma_{\mathrm{y}} = \sigma_\varepsilon^2 \mathrm{I}_n$ and $\mathrm{y} \sim N(\mathrm{X}\beta, \sigma_\varepsilon^2 \mathrm{I}_n)$. Based on relation (1), ordinary linear models (OLMs) are an additive model because of their basic mathematical structure. In an ordinary linear model (OLM), the interpretation of the coefficients simply depends on how the dependent variable changes for a unit increase in the independent variable [47].

### *3.2. Ordinary Least Squares (OLS)*

Different approaches can be used to estimate unknown parameters, e.g., maximum likelihood method (MMV), generalized method of moments (GMM). Next, we present the most common approach based on the method of ordinary least squares (OLS). The method of least squares looks for vector parameter estimates **β** in (1) and (2) so that it minimizes the sum of squares concerning these parameters as follows:

$$\hat{\boldsymbol{\beta}} = \begin{pmatrix} \hat{\beta}_0 \\ \hat{\beta}_1 \\ \vdots \\ \hat{\beta}_k \end{pmatrix} \coloneqq \mathrm{argmin} \sum_{i=1}^{n} \left(y_i - (\beta_0 + \beta_1 \cdot x_{i1} + \beta_2 \cdot x_{i2} + \cdots + \beta_k \cdot x_{ik})\right)^2 \qquad (3)$$

Where $\hat{\beta}$ represents a $k$-element column vector of optimal values [48]. It can be proven that the MMV leads to the same parameter estimates of an ordinary linear model as the OLS [49-51].The relation (3) where the sum of the squares of the vertical distances of the explained variable from the regression hyperplane is apparently minimized represents a minimization task through the parameters **β**, whose solution (using partial derivatives) is

$$\hat{\beta} = (\mathrm{X}^{\mathrm{T}}\mathrm{X})^{-1}\mathrm{X}^{\mathrm{T}}\mathrm{Y} \qquad (4)$$

Two important concepts can be derived from relation (4). The first is the c*alculated OLS estimates* for which it applies.

$$\hat{\mathrm{y}} = \mathrm{X}\hat{\beta} = \mathrm{X}(\mathrm{X}^{\mathrm{T}}\mathrm{X})^{-1}\mathrm{X}^{\mathrm{T}}\mathrm{y} \qquad (5)$$

The OLS estimate can also be interpreted geometrically as a projection of the observed values of $y$ into the linear subspace generated by the columns of the matrix **X** [50]. The second concept is the so-called OLS residuals which represent the unobserved values of the residual component ε, and which are estimated using the proposed model:

$$\hat{\varepsilon} = \mathrm{y} - \hat{\mathrm{y}} = \mathrm{y} - \mathrm{X}\hat{\beta} \qquad (6)$$

The estimate obtained using OLS according to relation (4) is considered the best linear unbiased estimate Best Linear Unbiased Estimator (BLUE) based on the Gauss-Markov theorem and in the case of meeting the ordinary linear models (OLMs) assumptions mentioned in the section *Ordinary Linear Models (OLMs)* [48].

### *3.3. ANOVA and Multiple Coefficients of Determination*

The estimated linear regression model should be compatible with the data. Therefore, it is necessary to assess its quality, e.g., based on the analysis of the variance of the explained variable or using a multiple coefficient of determination $\rho^2_{y.12\dots k}$, which represents the proportion of the variability of the explanatory variable that is explained by the linear regression function with the explanatory variable $X_1, X_2, \dots X_k$ from the total variability of the variable $Y$ [52].

A relatively simple tool in this context is the Residual Sum of Square (RSS).

$$RSS = \sum_{i=1}^{n} \hat{\varepsilon}_i^{\,2} = \sum_{i=1}^{n} (y_i - \hat{y}_i)^2 \qquad (7)$$

The minimization is based on the idea of OLS i.e., the smaller its non-negative value is, the more acceptable the regression model becomes. Another type used is the total variability – total sum of squares (Total Sum of Square – TSS), which can be expressed in the form.

$$TSS = \sum_{i=1}^{n} (y_i - \bar{y})^2 \qquad (8)$$

For completeness, we will define the variability explained by the model (Explained Sum of Square (ESS)).

$$ESS = \sum_{i=1}^{n}(\hat{y}_i - \bar{y})^2 \qquad (9)$$

From the geometric interpretation and the Pythagorean theorem [49] it holds.

$$TSS = ESS + RSS \qquad (10)$$

By point estimate $\rho^2_{y.12\dots k}$ is the sample multiple coefficients of determination $r^2_{y.12\dots k}$, which can be expressed analytically as follows:

$$r^2_{y.12\dots k} = \frac{ESS}{TSS} = 1 - \frac{RSS}{TSS} \qquad (11)$$

$r^2_{y.12\dots k}$ takes values from the interval $\langle 0; 1\rangle$. If its values are high (close to 1), then the regression model is of good quality and captures the variability of the dependent variable well $y_i$ around its average value $\bar{y}$, v otherwise, the model does not fit the given data very well [49].

If at least one of the explanatory variables included in the model causes changes in the explained variable, then the multiple correlation coefficient is non-zero [52]. We test the null hypothesis to verify the assumption of a non-zero value of the multiple correlation coefficient of the basis set.

$H_0: \rho_{y.12\dots k} = 0$ *(the multiple correlation coefficient is not statistically significant)* against the alternative hypothesis.

$H_1: \rho_{y.12\dots k} \neq 0$ *( the multiple correlation coefficient is statistically significant)* through the test characteristic.

$$\mathcal{F} = \frac{(n-k-1)\cdot r^2_{y.12\dots k}}{k\cdot\left(1-r^2_{y.12\dots k}\right)} = \frac{(n-k-1)\cdot\frac{ESS}{TSS}}{k\cdot\frac{RSS}{TSS}} = \frac{\frac{ESS}{k}}{\frac{RSS}{(n-k-1)}} = \frac{EMS}{RMS} \qquad (12)$$

We reject the null hypothesis $H_0$ if the value of the test characteristic belongs to the critical area $F > F_{1-\alpha}(k; n-k-1)$. The decision to accept the null hypothesis would further lead to not considering the given regression model from relation (1).

*3.4. Hypothesis Testing*

The point characteristics that were introduced in the previous part of the text *Ordinary Least Squares (OLS)* are the starting point for hypothesis tests. If the variability of the dependent variable explained by the regression model is sufficiently large compared to the unexplained variability of the dependent variable, then at least one of the explanatory variables significantly affects the explained variable [49]. This test is also known as a $\mathcal{F}$- *test of the statistical significance of the model*. We use it to verify the null hypothesis as below:

$H_0: \beta^* = 0_k$ *(All regression coefficients are equal to zero.)*

Alternative hypothesis is given *below:*

$H_0: \beta^* \neq 0_k$ *(at least one regression coefficient is non-zero).*

The rejection of the null hypothesis naturally leads to the question of which of the explanatory variables has a significant effect on the explained variable. It can provide the answer *test of statistical significance of the benefit* to which it additionally contributes $k$-explanatory variable to explain the variability of the explained variable [52]. An additional benefit of $k$-variable can be understood as the contribution of that variable if it has already been considered with others $(k-1)$ explanatory variables. The variability explained by the model is expressed by the relation (1.9). For the full model with $k$-explanatory variables, we use the index as explanatory variables $^{(1)}$ and for the reduced model with $(k-1)$ the explanatory variables, the index $^{(2)}$. The reduced model is created from the full model by omitting the variable whose contribution we are testing. An additional benefit $k$-explanatory variable can be expressed by a relation.

$$\Delta var = ESS^{(1)} - ESS^{(2)} \qquad (13)$$

Characteristics $ESS^{(1)}$ has $k$ degrees of freedom characteristic $ESS^{(2)}$ has $(k-1)$, degrees of freedom ($k$ parameters in the reduced model minus one sample mean $\bar{y}$). Their difference is then $k-(k-1)$, so 1 degree of freedom. Benefit of this $k$-explanatory variable will be significant if the statistic $\Delta var$ will be large enough considering the unexplained variability of the dependent variable. The validity of the null hypothesis will be confirmed with test.

$H_0$: *The additional contribution $k-$ explanatory variable to the explanation of the variability of the explained variable is statistically significant,*

*The alternative hypothesis is given below:*

$H_1$: *Additional benefit $k-$ explanatory variable to explain the variability of the explained variable is not statistically significant.*

We verify by comparing the test characteristic.

$$\mathcal{F} = \frac{\frac{\Delta var}{1}}{\frac{RSS^{(1)}}{(n-k-1)}} = \frac{\Delta var}{RMS^{(1)}} \qquad (14)$$

With a critical value $F_{1-\alpha}(1; n-k-1)$. Ak platí, $\mathcal{F} > F_{1-\alpha}(1; n-k-1)$, then we accept. $H_1$ and we reject the null hypothesis.

They are often verified, in econometric practice, *significance tests of regression parameters*; it is tested whether the $j$-regressor really belongs in the model [53]. In the test of statistical significance of the regression coefficient $\beta_j, j = 1,2,\dots,k$, we are testing the null hypothesis.

$H_0: \beta_j = 0$ *(The regression coefficient is not statistically significant.)*

Alternative hypothesis stated is given below:

$H_0: \beta_j \neq 0$ *( The regression coefficient is statistically significant.)*

The test characteristic is the so-called $t$-ratio that can be expressed in the form as

$$\frac{\hat{\beta}_i}{s_{b_i}} \sim t_{n-k}, \quad i = 1,2,\dots,n \qquad (15)$$

If the value of the $t$-ratio from relation (15) comes from the region of rejection of the null hypothesis $|t| > t_{1-\frac{\alpha}{2}}(n-k-1)$, then it can be assumed that changes in the independent variable $X_j$ cause changes in the dependent variable $Y$. In case of acceptance of the null hypothesis, at the level of significance, we cannot assume a linear dependence of the explained variable $Y$ from $j$-explanatory variable and therefore we will exclude the given variable from the model.

*3.5. Partial Correlation Characteristics*

If there is a linear relationship between the explanatory variables, then the joint effect of several explanatory variables on the explained variable cannot be calculated as the sum of the effect of the individual explanatory variables. Information about the net influence of the $j$-explanatory variable on the explained variable is provided by partial correlation characteristics, such as the partial correlation coefficient $\rho_{yk.12\dots(k-1)}$. It acquires values from the interval $\langle -1; 1\rangle$ based on which we can assess the direction and intensity of the linear dependence between the variables $Y$ a $X_k$, excluding the influence of the variables $X_1, X_2, \dots, X_{k-1}$ [49]. The estimate of the partial correlation coefficient is the sample partial correlation coefficient $r_{yk.12\dots(k-1)}$. The value of this coefficient can be expressed by the following relation:

$$r_{yk.12\dots(k-1)} = \frac{-r^{yk}}{\sqrt{r^{yy}.r^{kk}}} \qquad (16)$$

Where $r^{yk}, r^{yy}, r^{kk}$ are elements of the inverse correlation matrix $\mathrm{R}^{-1}$.

The most used test is naturally the statistical significance test of the partial correlation coefficient, in which we test the null hypothesis.

$H_0: \rho_{yk.12\dots(k-1)} = 0$ ( The partial *correlation coefficient is not statistically significant.)*

against the alternative hypothesis

$H_1: \rho_{yk.12\dots(k-1)} \neq 0$ (The partial *correlation coefficient is statistically significant.)*

To verify the validity of the null hypothesis, a test characteristic formally expressed by a relation is used.

$$F = \frac{(n-(k-1)-2)\cdot r^2_{yk.12\dots(k-1)}}{1-r^2_{yk.12\dots(k-1)}} = \frac{(n-k-1)\cdot\frac{\Delta var}{RSS^{(2)}}}{1-\frac{\Delta var}{RSS^{(2)}}} = \frac{(n-k-1)\cdot\frac{\Delta var}{RSS^{(2)}}}{\frac{RSS^{(2)}-\Delta var}{RSS^{(2)}}} =$$

$$= \frac{(n-k-1)\cdot\Delta var}{RSS^{(1)}} = \frac{\frac{\Delta var}{1}}{\frac{RSS^{(1)}}{n-k-1}} = \frac{\Delta var}{RSS^{(1)}} \qquad (17)$$

Where $RSS^{(2)} - \Delta var = RSS^{(2)} - \left[EMS^{(1)} - EMS^{(2)}\right] = RSS^{(2)} + EMS^{(2)} - EMS^{(1)} = RSS^{(1)}$ and which has $F$-distribution with degrees of freedom 1 and $(n-2)$ while we lower the range of the selection file by $(k-1)$ which is the number of eliminated variables [52].

*3.6. Numerical Application*

Answering research question number 2 required a quantitative description of the relationships between economic and financial quantities, especially the application of marketing in spa businesses in the Slovak Republic. We tried to explain the variability of changes in sales in spa businesses which are caused by changes in other factors. We analysed the statistical significance of the additional benefit of using marketing costs in these businesses using appropriate tests. We also dealt with power estimation or the intensity of the linear dependence between the sales of spa businesses and marketing costs while eliminating the influence of other variables. We used regression analysis as a tool which is currently the most important econometric tool in the quantitative analysis of financial data using the programming language R [54].

*3.7. Data*

*3.7.1. Analysis of Social Network Followers of Spa Businesses*

Data to answer RQ1 were obtained from online sources available on Facebook, Instagram, and YouTube platforms. The reference period was the month of May 2023. We chose the indicator of the number of followers on relevant platforms within the accounts on social networks of spa businesses located in Slovakia to evaluate the use of social networks in the marketing of spa businesses: Bardejov Spa , Hotel Granit Nová Polianka , Hotel Granit Piešťany – spa hotel, Hotel Granit Tatranské Zruby – climatic spa, Spa Bojnice , Spa Nový Smokovec, Spa Sliač, Spa Štós, Spa Trenčianske Teplice, Spa Vyšné Ružbachy, Spa Sklenné Teplice, The Natural Iodine Spa Číž, Spa Smrdáky (Ensana), Slovak Health Spa Piešťany (Ensana), Spa Rajecké Teplice, Slovak Health Spa Turčianske Teplice, SLOVTHERMAE and Spa Diamant Dudince. All the selected spa businesses are joint-stock businesses.

*3.7.2. The Analysis of Sales in Spa Businesses*

The analysis of sales in spa businesses was processed based on two types of data. The first case concerns data that was processed based on officially published financial statements for 25 spa businesses in Slovakia between 2012 and 2022, a total of 198 observations. In these data, we analysed individual variables from the internet platform [55] and spa tourism statistics [56]:

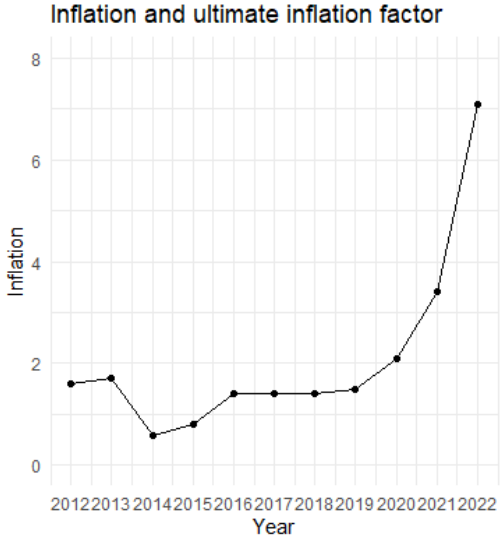
- Revenue: Dependent continuous variable, expressing the total annual sales (in EUR) of spa businesses in the theory of regression models it is an explained – $Y_i$.

- Marketing Costs (MC): An explanatory, continuous variable represents the amount of total annual costs (in EUR) allocated to marketing.
- Other Costs (OC): An explanatory, continuous variable represents the volume of all annual costs (EUR), but excluding marketing costs (e.g., labour costs, operating costs, etc.).
- Attendance (ATT): An explanatory, continuous variable represents the total annual number of visitors to spa establishments, in the monitored period.
- Geographical Location: An explanatory, categorical variable with 3 levels – Western, Central and Eastern Slovakia; it was modified into two artificial variables – Eastern.

Territory (ESVK) and Central Territory (MSVK) which encode the origin of sales. The variable Territory East is a binary variable. It takes on two values, either the value 1, if the sales come from eastern Slovakia or the value 0, if they come from another part. The binary variable central region also takes on two values, namely 1, if the sales come from Central Slovakia, or 0, if they come from another part of Slovakia. The vector of variables Territory East and Territory Central can acquire a vector of values:

- (0) : Sales from Eastern Slovakia.
- (0 1) : Sales from Middle Slovakia.
- (0 0) : Sales from Western Slovakia.

It is essential to adjust the data using the Harmonized Index of Consumer Prices (HICP) which is presented in Figure 1 to accurately compare sales and costs from 2012 to 2022. This index assesses consumer price inflation by taking into account spending patterns in each EU country, weighted according to the proportion of total consumer expenditure. The second dataset is obtained from publicly accessible information that is published on the Statistical Data Warehouse [57] reported for the Slovak Republic. Based on the investigated issue of the influence of factors on sales, the HICP – Recreation and Culture classification was chosen which best describes the behaviour of inflation in the spa industry.




| Year | Inflation | Price_Index | Inflation_Factor_to_Ultimate |
|---|---|---|---|
| 2012 | 1.6 | 1.016 | 1.254 |
| 2013 | 1.7 | 1.017 | 1.234 |
| 2014 | 0.6 | 1.006 | 1.213 |
| 2015 | 0.8 | 1.008 | 1.206 |
| 2016 | 1.4 | 1.014 | 1.197 |
| 2017 | 1.4 | 1.014 | 1.181 |
| 2018 | 1.4 | 1.014 | 1.164 |
| 2019 | 1.5 | 1.015 | 1.148 |
| 2020 | 2.1 | 1.021 | 1.131 |
| 2021 | 3.4 | 1.034 | 1.107 |
| 2022 | 7.1 | 1.071 | 1.071 |

**Figure 1.**
Inflation rate in 2012 – 2022 based on harmonized index of consumer prices – recreation and culture in Slovakia.
**Source:** [54].

The price levels of sales and costs of the dataset on spa businesses were multiplied by the so-called inflation factor to ultimate always for every year.

## 4. Results

*RQ1: What is the use of social networks in the marketing of spa businesses in the Slovak Republic?*

The number of social network users in the Slovak Republic is constantly growing. The social networking site Facebook has long had the largest number of users. In 2022, up to 79.33 % of users used Facebook. At the end of 2022, only 7.21 % of users used the Instagram platform. YouTube is the fourth most used social network in Slovakia and at the end of 2022 there were 2.08 % of users. In May 2023, the number of users of social networks in Slovakia decreased mainly for the social networks Instagram (- 2.14 %) and YouTube (- 0.97 %). On the other hand, the social network Facebook increased the number of users by 5.67 % [58].

Slovak spa businesses mostly use communication through the Facebook platform as part of their marketing strategy. The number of followers was the highest for the Facebook page of Slovak Health Spa Piešťany (Ensana) with 157,473 and Spa Rajecké Teplice with 107,000 followers. Spa Nový Smokovec has the smallest number of followers on the social network Facebook. (1600 followers) and Spa Kováčová (177 followers).

Spa Rajecké Teplice has the largest number of followers on Instagram (55,100 followers), Slovak Health Spa Piešťany appears under the joint brand Ensana (4,542 followers) and Spa Bardejov (1,371 followers). Spa Nimnica and Spa Štós do not use the Instagram platform.

The social network YouTube is mainly used by the Slovak Health Spa Piešťany for their promotion and visibility – spa group Ensana, with 1,220 subscribers. The Spa Smrdáky – Ensana also has the same number of customers. Spa Kováčová., Spa Bojnice, Spa Nimnica and Spa Štós do not use YouTube for marketing (see Figure 2).

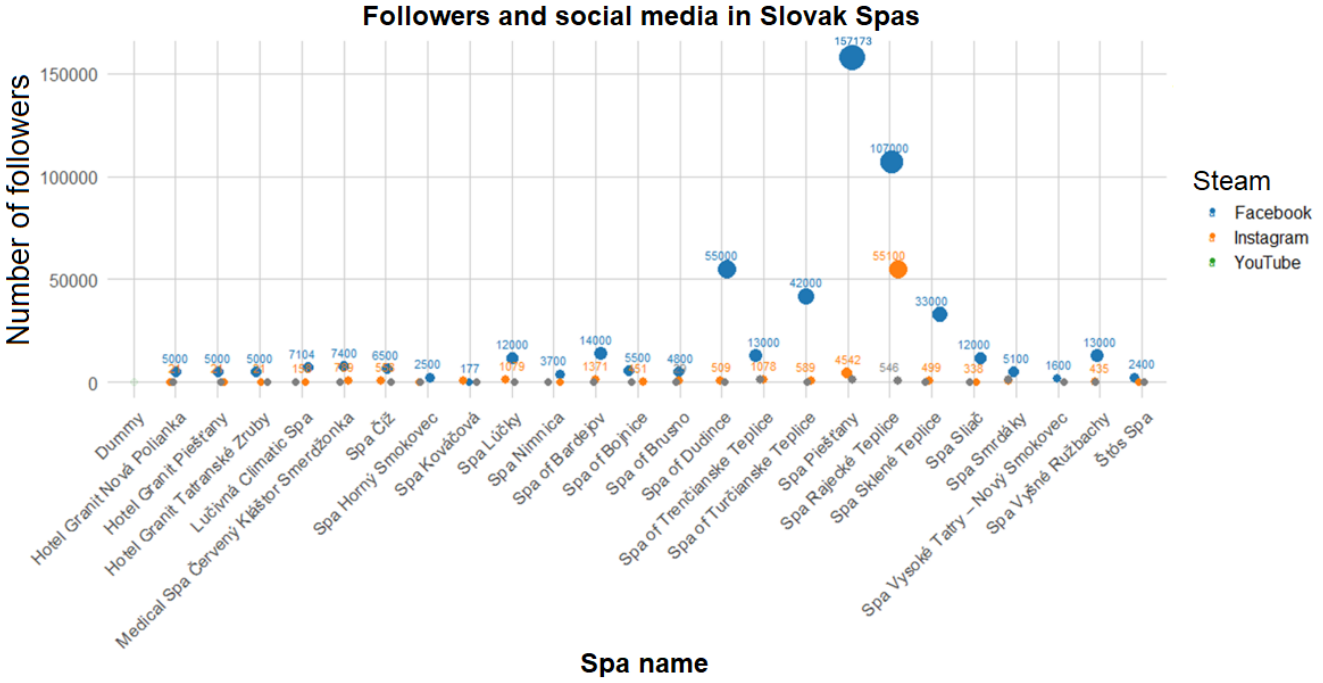



**Figure 2.**
Use of social networks of spa businesses in Slovakia (Number of followers).

The Slovak Health Spa Piešťany incurs higher marketing expenses but the resultant sales figures justify the investment. The spa's exceptional reputation is further corroborated by Lonely Planet's recognition of the establishment as one of the Top 20 spas in Europe [59]. The spa uses various social media platforms such as YouTube, Instagram, and Facebook to enhance its international visibility. This approach effectively promotes the spa to a broader audience, facilitating its recognition and reputation on a global level. Spas that incorporate social networks into their marketing strategy have demonstrated consistent or increased sales. Spa Kováčová has the fewest followers on social networks (after Instagram, Facebook and YouTube together 839 followers) and their sales were 886,258 euros in 2022 [55]. Spas are ranked among the spas with the lowest sales and reduced attendance [55]. The use of social media can impact spa revenue. Spa businesses should leverage social platforms to reach a larger audience, engage with potential customers, and increase revenue growth.

We present selected values of the selected indicator "number of followers" in spa businesses in the Czech Republic and Austria as a starting point for assessing the use of social networks in the marketing of Slovak spas. Spa Luhačovice had the highest number of followers on Facebook in 2023 among other Czech spas, 21,000. Spa Mariánské Lázně has 4,301 followers on Instagram in 2023, 250 followers on Facebook, but they do not have an official account on the YouTube platform. Followers on Facebook are low for the renowned spa brand due to a newly created page that has been operational since 2017. The Austrian spa company Therme Wien has 60,000 followers on Facebook, 8,698 followers on Instagram, and 357 subscribers on YouTube. Spa Therme Geinberg has had an account on Facebook since 2009 and in 2023, they have 85,000 followers. They have 12,000 followers on Instagram and 356 subscribers (2023) on YouTube. They had an Instagram account in 2015, YouTube in 2017 and Facebook in 2009.

Slovakian spas use the social network Facebook more where they have a larger number of followers compared to spas in the Czech Republic. On the contrary, they use Instagram less for marketing purposes which is the reason for the lower number of followers. The Slovak spa businesses that achieve the highest sales (Slovak Health Spa Piešťany) use social networks and the monitored indicator "number of followers" reaches a higher value than in the selected Austrian spa businesses. However, the approach to the use of social networks in the marketing of Slovak spas is very individual. It cannot be generally concluded that the level of sales achieved in Slovak spas is supported using social networks in marketing. However, in the context of digital marketing and client requirements, orientation to this form of digital marketing is essential in the context of the development of digital marketing and client requirements. The fact that Slovakian spas market their products largely through health insurance companies also contributes to their low usage. In general, the use of social networks in the marketing of spas in the Slovak Republic is a potential that has not yet been exploited.

RQ2: How do the marketing costs of spa businesses in the Slovak Republic affect their sales?

The following regression model was formulated *to* explain the variability of sales by changes in the values of marketing costs, other costs, traffic or territory.

$$revenue_i = \beta_0 + \beta_1 MC_i + \beta_2 OC_i + \beta_3 ATT_i + \beta_4 AE_i + \beta_5 AM_i + \varepsilon_i, \quad i = 1,2, \dots 198 \quad (18)$$

Using the OLS method from relation (4), the parameters of the model were estimated, and thus the estimate of the linear regression model (18) is the regression hyperplane in the form.

$$\widehat{revenue}_i = 1\,624\,995 + 6.67x_{MC_i} + 0.15x_{OC_i} + 397.6x_{Att_i} - 1\,681\,461x_{AE_i} - 1\,342\,895x_{AM_i} \quad (19)$$

The intercept $\hat{\beta}_0 = 1\,624\,995$ represents the conditional mean of sales in spa businesses assuming that all explanatory variables that have been included in the model assume a zero value. The estimated regression coefficient $\hat{\beta}_1 = 6.67$ states that with an increase in marketing costs by 1 monetary unit sales will increase by an average of 6.67 euros assuming that we are comparing the same spa businesses listed above. Regression coefficient $\hat{\beta}_2 = 0.15$. With an increase in other costs by 1 euro, annual sales will increase by 0.15 euro on average, assuming other things are being equal. Regression coefficient $\hat{\beta}_3 = 397.6$. With an increase in traffic by one client, sales will increase by an average of 397.6 euros, assuming ceteris paribus. Regression coefficient $\hat{\beta}_4 = -1\,681\,461$. Spa businesses located in the east of Slovakia (classified according to Nomenclature of territorial units for statistics (NUTS2 level) have an average of EUR 1,681,461 less revenue than spa businesses in central and western Slovakia. Regression coefficient $\hat{\beta}_5 = -1\,342\,895$. Spa businesses located in Central Slovakia (classified according to NUTS2) have an average of 1,342,895 euros less revenue than spa businesses in western and eastern Slovakia. Western Slovakia is considered the reference group for the explanatory variable territory.

How well the linear regression model estimated using OLS captures the variability of the modelled variable and whether the influence of any explanatory variable on sales in spa businesses is relevant will be assessed using analysis of variance. If the variability of sales explained by the regression model is large enough compared to the unexplained variability of sales, then at least one of the variables included in model (2) significantly affects the modelled variable sales in spa businesses. Using the $F$-test of statistical significance of the model, expressed by relation (12), we verify the truth of the null hypothesis.

$H_0$: $\beta^* = 0_k$, *respectively the regression model is not statistically significant.*

against the alternative hypothesis

$H_1$: $\beta^* \neq 0_k$, *respectively the regression model is statistically significant.*

Since the value of the test statistic $\mathcal{F} = 539.9$ is higher than the critical value $F_{1-\alpha}(k; n-k-1) = F_{0.95}(5{,}192) = 2.2611$, we reject the null hypothesis. We can also use $p$-value to verify the statistical significance of the regression model from relation (2). Since $p$-value $(p < 2.2e-16)$ is less than the significance level $\alpha = 0.05$, then we reject the null hypothesis about the statistical significance of the regression model. The proposed regression model formally expressed by relation (18) is statistically significant or at least one of the explanatory variables, marketing costs, other costs, attendance or territory affects sales in spa businesses in Slovakia based on the results achieved when testing hypotheses about the statistical significance of the model.

The quality of settlement or the quality of the model estimation can also be assessed based on Figure 3 where the points with coordinates $[y_i = \hat{y}_i]$ are concentrated around the straight red line which indicates a relatively good quality of alignment and a high value of the coefficient of determination where $r^2_{y.12345} = 0.9336$. We can explain the variability of the variable sales of spa businesses to 93.36 % by estimating the regression model from relation (19). The remaining 6.64 % of sales variability is caused by factors not included in the regression model (other explanatory variables) and random effects.

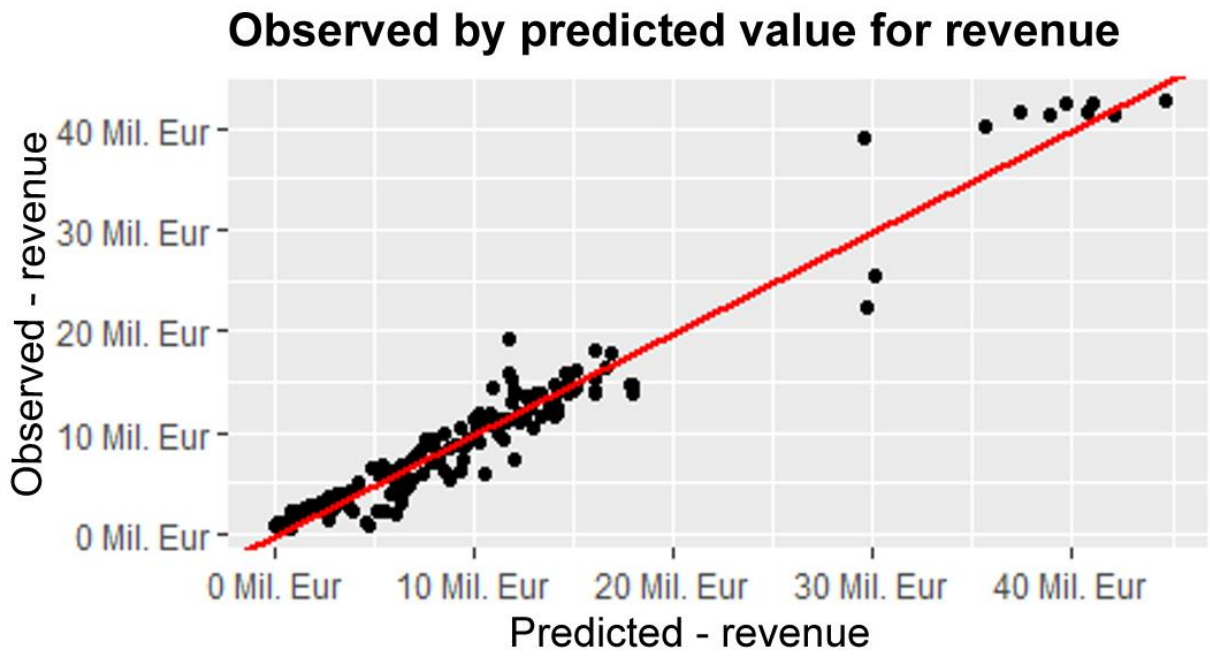



**Figure 3.**
Dot plot of the actual values of the sales variable concerning its predicted values.
**Source:** [54].

In terms of the stated goals, we quantified and analysed in more detail the statement whether the contribution of the variable marketing costs is statistically significant at the significance level of 0.05. Table 1 contains the so-called type I sums of squares (type I SS) which are also called sequential sums of squares. They represent the distribution of the explained sum of square from relation (9) into the components of the sums of squares because of the gradual addition of individual explanatory variables to the regression model. In the type I SS column, the additional contributions of the individual explanatory variables are calculated in the rows, assuming that the variables that are in the previous rows have already been considered in the model. Type II sums of squares (type II SS) are usually called partial sums of squares and express the increments of explained variability in spa sales due to the addition of the relevant variable to a model that already contained all other explanatory variables listed in the output. Type II sums of squares do not depend on the order in which the explanatory variable is listed in Table 1. Moreover, if the listed variables are correlated (which is the most common situation in practice), there is no point in summing type II sums of squares because unlike type I sums, they do not provide a distribution SSM. From the above, it follows that the type II SS column provides values $\Delta var$ from relation (13).

**Table 1.**
Contribution evaluation of explanatory variables.

| | DF | Type I SS | Type II SS |
|---|---|---|---|
| Marketing costs | 1 | $7.640 \cdot 10^{15}$ | $1.085 \cdot 10^{14}$ |
| Other costs | 1 | $3.048 \cdot 10^{15}$ | $3.176 \cdot 10^{15}$ |
| Attendance | 1 | $3.475 \cdot 10^{15}$ | $2.749 \cdot 10^{15}$ |
| East Slovakia | 1 | $1.718 \cdot 10^{13}$ | $5.529 \cdot 10^{15}$ |
| Middle Slovakia | 1 | $4.099 \cdot 10^{15}$ | $4.099 \cdot 10^{13}$ |

**Source:** [54].

We will verify the significance of the contribution of the variable marketing costs with a null hypothesis test.

$H_0$: *The additional contribution of the variable marketing costs to explain the variability of sales of the dependent variable is not statistically significant.*

against the alternative hypothesis

$H_1$: *The additional contribution of the variable marketing costs to explain the variability of sales of the dependent variable is statistically significant.*

Value $\Delta var = 1.085 \cdot 10^{14}$ is determined from Table 1 and the value $RMS^{(1)} = 5.107 \cdot 10^{12}$ was calculated using the R language based on relations (7) and (12). Since the value of the test statistic $\mathcal{F} = 21.24$, according to relation (14) is higher than the value of the critical value $F_{1-\alpha}(1; n-k-1) = F_{0.95}(1, 192) = 3.8903$ , we reject the null hypothesis. As per the analysis, it can be inferred that when considering other factors like attendance, geographical location in Eastern and Central Slovakia and additional expenses, the marketing costs variable bears a statistically significant impact of 0.05 on elucidating the deviation in the mean yearly sales of spa businesses in Slovakia. The results obtained from the statistical significance presents Table 3 test of the explanatory variable are equivalent to the test of statistical significance of the corresponding regression coefficient as expressed by the notation according to relation (15). In our analysis, we aim to assess the strength of the linear relationship between sales of spa businesses and marketing expenses. We will employ a statistical significance test known as the partial correlation coefficient to effectively control for the influence of other variables. This test will enable us to evaluate the null hypothesis with regards to our research question.

$H_0$: $\rho_{yMC.234} = 0$ ( partial *correlation coefficient is not statistically significant).*

against the alternative hypothesis

$H_1$: $\rho_{yMC.234} \neq 0$ ( partial *correlation coefficient is statistically significant*).

Table 2 shows the values of the partial correlation coefficients (Pearson Partial Correlation Coefficient) calculated based on relation (16).

**Table 2.**
Assessment of the intensity of the relationship between the explained and explanatory variables, when other variables are eliminated, using Pearson's partial correlation coefficient.

| | Pearson partial correlation coefficients | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Revenue** | **Marketing costs** | **Other Costs** | **Attendance** | **Area Eastern (AE)** | **Area Middle (AM)** | **Area Western (AW)** |
| Revenue | 1.000 | 0.342 | 0.479 | 0.875 | -0.875 | 0.875 | -0.873 |
| Marketing costs | 0.342 | 1.000 | -0.097 | -0.058 | 0.060 | -0.058 | 0.055 |
| Other costs | 0.479 | -0.097 | 1.000 | -0.204 | 0.204 | -0.204 | 0.204 |
| Attendance | 0.875 | -0.058 | -0.204 | 1.000 | 1.000 | -1.000 | 1.000 |
| Area Eastern (AE) | -0.875 | 0.060 | 0.204 | 1.000 | 1.000 | 1.000 | -1.000 |
| Area middle (AM) | 0.875 | -0.058 | -0.204 | -1.000 | 1.000 | 1.000 | 1.000 |
| Area Western (AW) | -0.873 | 0.055 | 0.204 | 1.000 | -1.000 | 1.000 | 1.000 |

**Source:** [54].

**Table 3.**
Calculated *p*-values for the statistical significance test of the partial correlation coefficient.

| | p- values | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Revenue** | **Marketing costs** | **Other costs** | **Attendance** | **Area eastern (AE)** | **Area middle (AM)** | **Area western (AW)** |
| Revenue | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Marketing costs | 0.000 | 0.000 | 0.180 | 0.426 | 0.405 | 0.424 | 0.449 |
| Other costs | 0.000 | 0.180 | 0.000 | 0.005 | 0.004 | 0.005 | 0.005 |
| Attendance | 0.000 | 0.426 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| Area Eastern (AE) | 0.000 | 0.405 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| Area middle (AM) | 0.000 | 0.424 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| Area Western (AW) | 0.000 | 0.449 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |

**Source:** [54].

Partial correlation coefficient $r_{yMC.234} = 0.3415$: There is a weaker and direct linear relationship between sales of spa businesses and marketing costs.

Since the calculated *p*-value ($p - value = 0.0000$), see output 2b is less than $\alpha = 0.05$, n we reject the hypothesis of a statistically insignificant dependence at the significance level of 0.05. In other words, marketing costs at the significance level of 0.05 statistically significantly influence the sales of spa businesses assuming other things are being equal (when eliminating the influence of all other variables that we included in the regression model).

## 5. Conclusion

Marketing is an indispensable aspect of the tourism industry given its potential to boost attendance, enhance client satisfaction and promote brand recognition for businesses and destinations. In a nutshell, these benefits culminate in better financial outcomes for tourism establishments. It is essential to use tools and marketing procedures that reflect current technological possibilities and consumer needs. Currently, it is clearly marketing implemented in the space of social networks.

Spa tourism has a rich tradition in the Slovak Republic due to the potential and perspective of growth. That is why we conducted a survey on the use of social networks in the environment of spa businesses in Slovakia for the year 2023 (RQ1). Spa businesses use Facebook to the greatest extent, YouTube, and Instagram to a lesser extent. Among 28 spa businesses, we identified Slovak Health Spa Piešťany as the subject with the greatest use of social networks in marketing. However, the average monthly number of followers proves weak or ineffective use of marketing on social networks in Slovak spas. The use of social media platforms in Slovak spas is currently limited. However, they represent an untapped potential for the industry to improve performance indicators for businesses. We have formulated the research question 2 (RQ2) and a methodological apparatus with relevant hypotheses based on the recognition of the premise about the positive effects of marketing on performance. Our aim was to determine the impact of marketing on the performance of the spa companies in the Slovak Republic. Turnover was used as the main performance indicator. The main finding is marketing costs that have a statistically significant effect on the turnover of spa businesses in the Slovak Republic. This finding highlights the importance of effective marketing implementation in the spa industry with a focus on digitalization and the use of social networks. The chosen regression model expresses that, ceteris paribus, a 1 euro increase in marketing costs is associated with a 6.67 euro increase in sales. With an increase in other costs by 1euro, annual sales will increase by 0.15 euros on average with an increase in traffic by one client, sales will increase by 397.6 euros on average. Spa businesses located in the east of Slovakia (classified according to NUTS2) have an average annual turnover of EUR 1,681,461 lower than spa businesses in central and western Slovakia. Spa businesses located in Central Slovakia (classified according to NUTS2) have an average turnover of EUR 1,342,895 lower than spa businesses in Western and Eastern Slovakia assuming all other variables are unchanged.

The achieved results support statements about the positive impact of marketing on performance in Slovak spa businesses. Investments in marketing processes required by the current market can be initiated using these as a starting point. This is also reflected in the insufficient utilization of social media in marketing Slovak spas. Further research could investigate the impact of modern technology on spa business marketing performance. Performance encompasses visitor numbers, occupancy and customer satisfaction. However, rigorous primary research is necessary due to the limited available information on spa businesses. The availability of statistical data in the environment of spa businesses in Slovakia is very limited in both quality and quantity which significantly limits the results of the study.

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