Spa Enterprises in Rural and Urban Settings: Evidence from Slovakia

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Abstract: Spa tourism constitutes a core segment of health-related tourism in Slovakia and can play an important role in tourism development in smaller settlements and rural areas. Despite its relevance for local economies, empirical evidence on spatial differences in the economic performance of spa enterprises remains limited. This paper examines whether spa enterprises located in towns differ from those situated in villages in terms of economic scale and labor productivity. The analysis uses enterprise-level data for the year 2024 (n = 28) covering total revenues, average employment, and labor productivity expressed as revenue per employee. Group differences between town- and village-based spas were assessed using descriptive statistics and one-way analysis of variance (ANOVA) and the Mann-Whitney U test. The results indicate tendencies toward higher revenues and employment levels in town-based enterprises, though these differences were not consistently confirmed across parametric and non-parametric tests. The study provides empirical evidence on spatial differences in the Slovak spa sector and highlights that observed town-village disparities relate mainly to enterprise scale rather than labor productivity.

Keywords: spa enterprises, economic performance, rural-urban differences

JEL Classification codes: Z32, R11, L25

INTRODUCTION

Health spa tourism represents a segment of health tourism grounded in the therapeutic use of natural healing resources, such as thermal waters, peloids, and climatic conditions, and is distinguished from commercial wellness by its embeddedness in legally defined regulatory frameworks governing the certification of natural sources and qualifications of personnel (Smith & Puczkó, 2014). Spa and medical care are important not only from the perspective of healthcare, but also in terms of the attractiveness of the destinations in which the spa is located (Čabinová et al., 2021). A defining feature of the sector is its dependence on natural healing resources (Jakubíková et al., 2019), which means that spa enterprises are distributed according to geological rather than settlement logic, unlike most other tourism activities, where proximity to urban agglomerations tends to confer competitive advantages. This raises an empirically open question of whether spa enterprises located in towns perform differently from those located in villages. The aim of this study is to determine whether spa enterprises located in towns differ from those located in villages in terms of economic scale and labor productivity, and to identify the nature and significance of any such differences, using data of all certified natural healing spa enterprises operating in Slovakia. In this study, spa enterprises refer

specifically to certified natural healing spa facilities operating within the Slovak healthcare system.

1 LITERATURE REVIEW

Slovak spa enterprises are part of the public healthcare system, which is under considerable pressure to the demographic trend of an ageing population and rising healthcare costs (Čabinová et al., 2021). Spa care indicated for health reasons is fully or partially covered by public health insurance, with the indications and length of medical stays governed by Act No. 577/2004, while the financial stability of enterprises depends on maintaining a balance between insurance-reimbursed and self-paying demand (Derco, 2020). Derco & Pavlišinová (2017) analysed the financial situation of Slovak spa enterprises and the relationship between medical and non-medical forms of spa tourism, pointing to the key role of the public health insurance system for occupancy and financial stability, and highlighting that the stability of spa legislation has a direct impact on the sector´s economic results. Štefko et al. (2020) examined the financial situation of Slovak spa enterprises and identified significant heterogeneity in their economic performance. Čabinová & Onuferová (2019) evaluated the performance and efficiency of Slovak spa enterprises using EVA and the simplex method, concluding that both dimensions pointed to systematic shortcomings in financial management across the sector. Čabinová et al. (2021) further assessed Slovak spa enterprises using the Financial Health and Prediction rating model based on selected financial ratio indicators and prediction models, while Vašaničová et al. (2025) applied cluster analysis across five financial dimensions, namely profitability, efficiency, cost efficiency, liquidity, and indebtedness to capture differences in financial performance and strategic positioning among Slovak spa enterprises.

The key factor to enterprise success is consistent monitoring of the market situation, as a competitive struggle is won only by enterprises that are adequately dedicated to measuring and evaluating performance and efficiency using the right approaches and tools (Gallo & Mihalčová, 2016). The measurement and evaluation of enterprise performance in the spa sector thus represents a fundamental prerequisite for improving strategic decision-making, and Slovak spa enterprises are no exception given Slovakia´s position of one of Europe´s prominent spa destinations (Čabinová & Onuferová, 2019). Performance can be understood as the ability to consistently deliver and sustain output, whereby a high-performing employee makes effective use of available time and resources, adding value to the enterprise (Peñalba-Aguirrezabalaga et al., 2021). In the spa sector specifically, services require high employee commitment, as the quality of service delivery depends directly on the diligence and expertise of the workforce (Grenčíková et al., 2022), and a high proportion of services is tied to professional qualifications, making the workforce both a critical input and a primary cost (Jakubíková et al., 2019). Employment in spa enterprises thus represents a direct and stable form of regional economic contribution, particularly in peripheral areas where spas often function as dominant local employers (Štefko et al., 2020).

Unbalanced regional economic development is a widespread phenomenon, as differences in tourism resources, social economies, transportation infrastructure, and geographic conditions result in unequal distribution of tourism with disparities evident not only between countries, but also between regions and locations within a single country (Deng, 2025). Traditional villages have been particularly affected by industrialization and modernization, experiencing rural restructuring, declining vitality, out-migration of educated youth, and population ageing. Many European countries perceive rural tourism as a means of addressing poverty and ensuring the long-term economic viability of rural communities (Yanan et al., 2024), and the diversification of rural economies toward sustainable forms is understood as contributing to poverty reduction, quality of life, improvement, and the minimization of social and environmental degradation (Petrović et al., 2018). Tourism can be seen as an approach to

sustainable development covering socio-cultural, economic, and environmental impacts in rural communities (Chassang et al., 2024; Martínez et al., 2019; Amir et al., 2015). Health spas are increasingly situated in rural areas, where they leverage the unique ecological and cultural attributes of these environments, with rural landscapes rich in mineral springs providing an ideal setting for spa tourism (Mijatov Ladičorbić et al., 2024). Spa tourism is identified as a key growth sector that preserves existing employment, generates new jobs, and creates additional value through multiplier effects benefiting surrounding small and medium-sized enterprises, whereby contributing to the reduction of spatial and regional disparities (Bacsi et al., 2012). Rural spa tourism connects natural healing resources, traditional hospitality, and small-scale entrepreneurship in ways that foster both recovery and income generation, simultaneously providing restorative experiences for visitors while supporting local employment, supply chains, and service innovation (Cico et al., 2025; Arsić et al., 2025).

Research Gap and Hypotheses

Despite a growing body of research on the financial performance of Slovak spa enterprises and on the economic role of spa tourism in rural development, no study to date has directly compared enterprise-level economic performance between spa enterprises located in towns and those located in villages within a single national regulatory framework. The existing literature consistently documents substantial heterogeneity in the financial performance of Slovak spa enterprises (Štefko et al., 2020; Čabinová & Onuferová, 2019; Vašaničová et al., 2025), and confirms that rural spa destinations can generate meaningful economic contributions regardless of their distance from urban centers (Cico et al., 2025; Mijatov Ladičorbić et al., 2024). However, whether settlement type constitutes a significant differentiator of enterprise performance remains an open empirical question.

Building on these considerations, previous research suggests that enterprise performance may differ between urban and rural areas due to variations in accessibility, infrastructure and demand concentration (Deng, 2025; Petrović et al., 2018). In the context of spa tourism, however, these general patterns may not fully apply, as spa enterprises are bound to natural healing resources whose distribution is independent of settlement hierarchy (Jakubíková et al., 2019). Therefore, the present study addresses this gap by formulating and testing the following hypotheses:

$H1_0$: There is no significant difference in revenues between town- and village-based spa enterprises.

$H1_1$: There is a significant difference in revenues between town- and village-based spa enterprises.

$H2_0$: There is no significant difference in the number of employees between town- and village-based spa enterprises.

$H2_1$: There is a significant difference in the number of employees between town- and village-based spa enterprises.

$H3_0$: There is no significant difference in labor productivity between town- and village-based spa enterprises.

$H3_1$: There is a significant difference in labor productivity between town- and village-based spa enterprises.

2 METHODOLOGY

The aim of this study is to determine whether spa enterprises located in towns differ from those located in villages in terms of economic scale and labor productivity, and to identify the nature and significance of any such differences.

The study addresses the following research questions:

RQ1: Do town-based spa enterprises generate significantly higher revenues than village-based spa enterprises?

RQ2: Do town-based spa enterprises employ significantly more employees than village-based spa enterprises?

RQ3: Is there a significant difference in labor productivity between town- and village-based spa enterprises?

These research questions directly correspond to the three hypotheses formulated in the Literature Review section and are tested through the statistical analysis described below.

Data, Sources and Variables

Three indicators of economic performance were examined in this study. Total revenues (€) represent the primary measure of enterprise-level economic output. The number of employees captures the direct contribution of enterprises to local labor markets and serves as the primary measure of enterprise scale. Labor productivity is defined as the ratio of total revenues to the average number of employees, expressed in euros per employee, and enables meaningful comparisons of operational efficiency across enterprises of different sizes.

The study is based on enterprise-level data for the reference year 2024. Data on revenues were obtained from the profit and loss statements of individual spa enterprises. Data on the average number of employees were collected from the annual reports and notes to the financial statements of the respective enterprises. The mentioned data sources are publicly available as part of the statutory disclosure obligations applicable to legal entities in Slovakia.

The list of analyzed enterprises was compiled from the official register of natural healing spas published by the Inspectorate of Spas and Springs, which is the competent authority for the certification and oversight of natural healing spas in Slovakia. The dataset encompasses all 28 enterprises registered as either natural healing spas or spa treatment facilities in 2024: Bardejovské kúpele a.s.; Kúpele Bojnice a.s.; KB SPA s.r.o.; PIENINY RESORT, s.r.o.; Prírodné jódové kúpele Číž, a.s.; Kúpele Dudince, a.s.; Kúpele Kováčová, s.r.o.; KÚPELE LÚČKY a.s.; Kúpele Nimnica, a.s.; SLOVENSKÉ LIEČEBNÉ KÚPELE PIEŠŤANY, a.s.; Slovenské liečebné kúpele Rajecké Teplice a.s.; Kúpele Sliač a.s.; Liečebné termálne kúpele a.s.; Kúpele Trenčianske Teplice, a.s.; Slovenské liečebné kúpele Turčianske Teplice a.s.; Kúpele Vyšné Ružbachy a.s.; KÚPELE LUČIVNÁ, a.s.; KÚPELE ŠTÓS, a.s.; Kúpele Horný Smokovec s.r.o.; KÚPELE NOVÝ SMOKOVEC, a.s.; Sanatórium Tatranská Kotlina n.o.; Kúpeľno-liečebný ústav MV SR Družba; SLOVTHERMAE, Kúpele Diamant Dudince, š.p.; Špecializovaný liečebný ústav Marína, š.p.; HOREZZA, a.s.; Kúpeľno-liečebný ústav MV SR Arco; Kúpeľno-rehabilitačný ústav MV SR Bystrá; Sanatórium Dr. Guhra n.o..

Each enterprise was assigned to one of two groups, town or village, based on the official administrative status of the municipality in which the spa is located, as defined under Slovak law. Of the 28 spa enterprises included in the analysis, 16 are located in towns and 12 in villages.

Methods

Group differences in revenues, employment, and labor productivity between town- and village-based spa enterprises were assessed using one-way analysis of variance (ANOVA). ANOVA

tests the null hypothesis that the means of two or more groups are equal by decomposing the total variance in the data into between-group and within-group components. The resulting F-statistic is the ratio of between-group variance to within-group variance; a statistically significant F-value indicates that at least one group mean differs from the others. ANOVA assumes that the observations within each group are drawn from a normally distributed population and that the variances across groups are homogeneous (homoscedasticity). Violation of either assumption may lead to inflated Type I error rates and unreliable p-value.

Prior to ANOVA, both assumptions were formally tested. Normality within each group was assessed using the Shapiro-Wilk test (Shapiro & Wilk, 1965), which evaluates the null hypothesis that the data are drawn from a normally distributed population against the alternative hypothesis that they are not. The test statistic W ranges from 0 to 1, with values close to 1 indicating approximate normality; a statistically significant result (p-value < 0.05) indicates a departure from normality. The Shapiro-Wilk test was selected because it has been demonstrated to have the highest statistical power among commonly used normality tests (Razali & Wah, 2011).

The homogeneity of variances across groups was evaluated using Levene's test, which applies an F-statistic to the absolute deviations of observations from their respective group means (Levene, 1960). The null hypothesis of Levene´s test states that the variances of the compared groups are equal; rejection of this null hypothesis indicates heteroscedasticity and casts doubt on the validity of ANOVA results. Levene´s test is robust to departures from normality, making it appropriate as a preliminary check prior to ANOVA (Gastwirth et al., 2009).

Where the assumptions of normality or homogeneity of variances were found to be violated, the Mann-Whitney U test was applied as a non-parametric alternative to ANOVA (Mann & Whitney, 1947). The Mann-Whitney U test evaluates the hypothesis that two independent groups have the same distribution by comparing the ranks of all observations pooled across both groups. The test statistic U is defined as the number of times an observation from one group precedes an observation from the other group in the combined ranking. Because the Mann-Whitney U test operates on ranks rather than raw values, it does not require normality or homoscedasticity. Both ANOVA and Mann-Whitney U test results are reported for all three variables to allow transparent comparison of parametric and non-parametric findings.

The strength and direction of the linear relationship between total revenues and the number of employees was assessed using Pearson´s correlation coefficient (r). The coefficient ranges from -1 to +1, where values close to ±1 indicate a strong linear association and values close to 0 indicate the absence of a linear relationship. Statistical significance of the correlation was evaluated using a two-tailed t-test. A significance level of $\alpha = 0.05$ was applied throughout the analysis. All statistical computations were performed in RStudio.

3 RESULTS AND DISCUSSION

The presented analysis is based on data from 28 spa enterprises operating in Slovakia in 2024, classified according to their location into two groups: town-based enterprises (n = 16) and village-based enterprises (n = 12). Three indicators of economic performance were examined: total revenues, number of employees, and labor productivity expressed as revenue per employee.

As shown in Table 1, town-based spa enterprises recorded considerably higher mean revenues (€12,514,136) compared to village-based enterprises (€4,831,045). A similar pattern is observable for employment, with town-based enterprises employing on average 220 persons compared to 101 in village-based enterprises. In contrast, labor productivity showed markedly

less pronounced difference between the two groups, with mean values of €53,222 per employee in towns and €47,938 in villages (a difference of approximately 11%).

Tab. 1 Descriptive statistics by settlement type

Variable	Town mean	Town median	Village mean	Village median
Revenues (in €)	12,514,136	9,492,703	4,831,045	4,469,452
Employees	220.2	184.0	101.0	107.5
Labor productivity (in €)	53,222	53,561	47,938	47,410

Source: Authors' own calculations

Prior to hypothesis testing, the assumptions underlying one-way ANOVA were examined. The Shapiro-Wilk test was applied to assess normality within each group, and Levene's test was used to evaluate the homogeneity of variances. The results are presented in Table 2.

Tab. 2 Results of assumption tests (Shapiro-Wilk = SW; Levene´s test)

Variable	Shapiro-Wilk W (town)	Shapiro-Wilk p-value (town)	Shapiro-Wilk W (village)	Shapiro-Wilk p-value (village)	Levene's F-statistic	Levene's p-value
Revenues	0.808	0.003*	0.878	0.082	7.356	0.012*
Employees	0.800	0.003*	0.960	0.788	6.017	0.021*
Labor productivity	0.784	0.002*	0.951	0.646	0.030	0.0864

Source: Authors' own calculations

The Shapiro-Wilk test revealed significant departures from normality in the town group for all three variables (revenues: W = 0.808, p-value = 0.003; employees: W = 0.800, p-value = 0.003; labor productivity: W = 0.784, p-value = 0.002), while the village group met the normality assumption in all cases. Levene's test further indicated heterogeneity of variances for revenue (F = 7.356, p-value = 0.012) and employment (F = 6.017, p-value = 0.021), while homogeneity was confirmed for labor productivity (F = 0.030, p-value = 0.864). Given the violations of normality and variance homogeneity for revenue and employment, the Mann-Whitney U test was applied alongside ANOVA as a non-parametric alternative for all three variables. For labor productivity, where both assumptions were partially satisfied, ANOVA results are considered the primary basis for inference.

The results presented in Table 3 reveal an inconsistent pattern for H1. One-way ANOVA indicated a statistically significant difference in revenues between town- and village-based enterprises (F = 4.707, p-value = 0.039), which would support rejection of H10. However, the Mann-Whitney U test, which is more appropriate given the distributional properties documented in Table 2, yielded only a borderline result (U = 135, p-value = 0.074), falling short of the conventional significance threshold. Given these distributional properties, the Mann-Whitney U test is considered the more reliable basis for inference, and its result does not support the rejection of H10. H1 is therefore classified as inconclusive. A comparable pattern was observed for H2, as ANOVA approached but did not reach conventional statistical significance (F = 4.204, p-value 0.051), and the Mann-Whitney test similarly failed to confirm

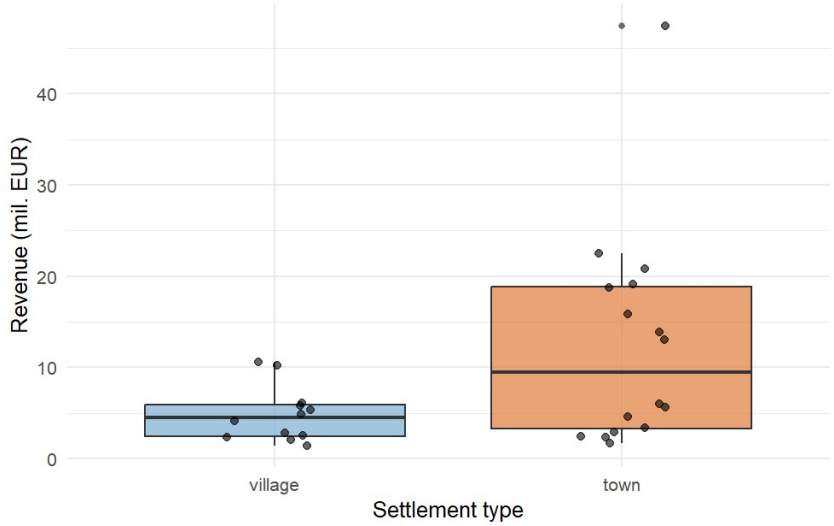
the difference (U = 132, p-value = 0.099). H20 is therefore not rejected. The distributions of revenue and employment by settlement type are illustrated in Figures 1 and 2.

Tab. 3 Results of one-way ANOVA and Mann-Whitney U test

Variable	ANOVA F-statistic	ANOVA p-value	Mann-Whitney U test U	Mann-Whitney U test p-value	Conclusion
Revenues	4.704	0.039*	135	0.074	H1 inconclusive
Employees	4.204	0.051	132	0.099	H20 not rejected
Labor productivity	0.829	0.371	115	0.390	H30 not rejected

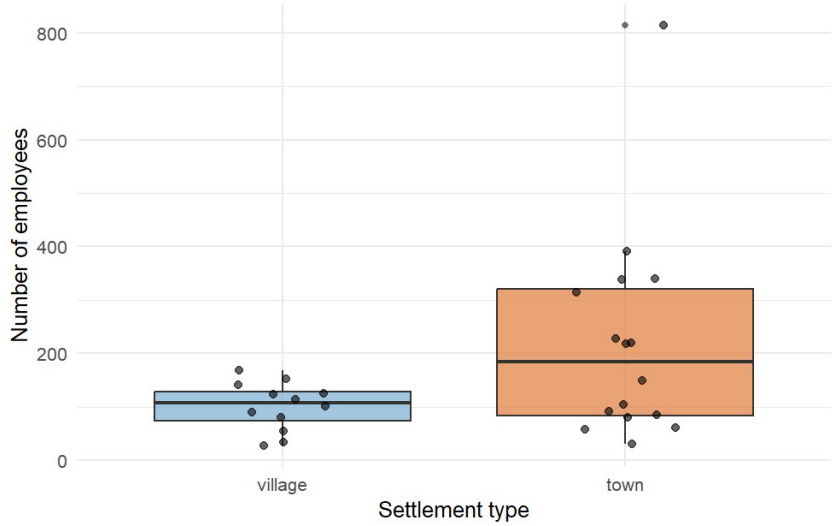
Source: Authors' own calculations

Fig. 1 Revenues of spa enterprises by settlement type



Source: Authors' own processing in RStudio

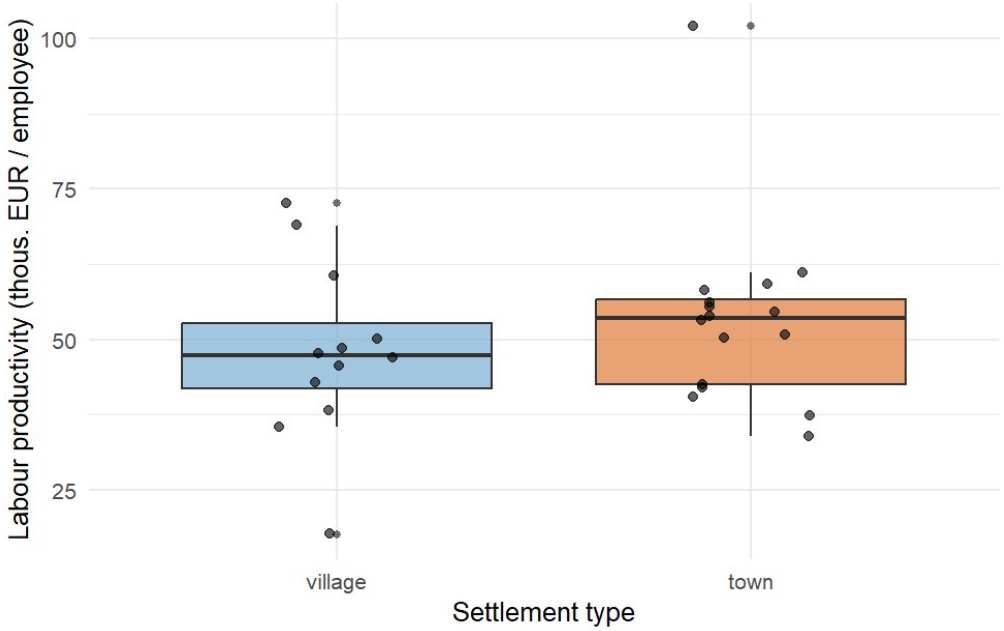
Fig. 2 Number of employees in Slovak spa enterprises by settlement type



Source: Authors' own processing in RStudio

By contrast, the results for H3 were consistent and robust across both tests. Neither ANOVA (F = 0.829, p-value = 0.371) nor the Mann-Whitney U test (U = 115, p-value = 0.390) detected a statistically significant difference in labor productivity between the two groups. H30 is therefore not rejected and the data provide no evidence that town-based spa enterprises achieve higher labor productivity than the village-based spa enterprises. As illustrated in Figure 3, the distributions of labor productivity overlap substantially between the two groups.

Fig. 3 Labor productivity in spa enterprises by settlement type

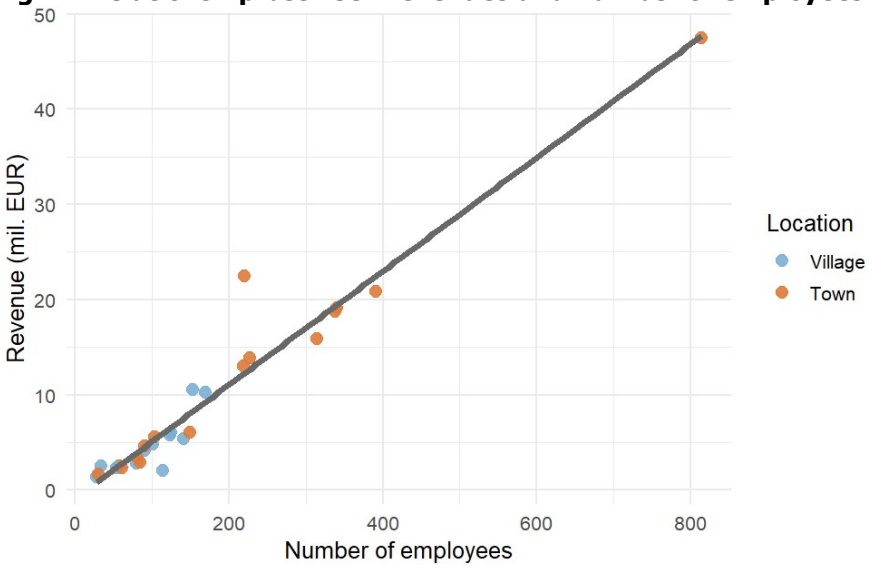


Source: Authors' own processing in RStudio

To further contextualize the observed patterns, the relationship between total revenues and the number of employees was examined using Pearson´s correlation coefficients. The analysis revealed a very strong positive association (r = 0.97, p-value < 0.001), indicating that enterprise scale (as measured by employment) is the dominant predictor of revenue levels across the sector. As illustrated in Figure 4, this relationship holds consistently across both settlement types, with town-based enterprises concentrated at higher values on both axes. This finding reinforces the interpretation that the observed town-village disparities in revenues and employment are primarily a reflection of differences in enterprise scale rather than of location-specific competitive advantage.

The results of this study indicate that town-based spa enterprises tend to operate at a larger scale than their village-based counterparts, generating higher revenues and employing more workers on average. However, once scale is accounted for through the labor productivity indicator, no significant difference between the two groups is detected. This finding carries a clear interpretive implication: the observed town-village disparity in the Slovak spa sector is primarily a disparity in enterprise size, not in operational efficiency. A village-based spa enterprise is not at an inherent disadvantage in terms of how effectively it converts its workforce into revenue. The very strong correlation between revenues and the number of employees (r = 0.97, p < 0.001) reinforces this interpretation, as it confirms that scale is the dominant structural factor shaping revenue differences across the sector as a whole, regardless of settlement type.

Fig. 4 Relationship between revenues and number of employees of spa enterprises



Source: Authors' own processing in RStudio

A particularly noteworthy aspect of the results is the inconsistency observed for H1. One-way ANOVA yielded a statistically significant difference in revenues between town- and village-based enterprises ($F = 4.704$, $p = 0.039$), while the Mann-Whitney U test (which is more appropriate given the documented violations of normality in the town group and the heterogeneity of variances) produced only a borderline result ($U = 135$, $p = 0.074$). This inconsistency is not unexpected given the characteristics of the dataset: with only 28 enterprises in the population, the statistical power of both tests is inherently limited, and the presence of several large town-based enterprises with revenues substantially above the group median introduces skewness that can inflate parametric test statistics. The inconclusive result for H1 should therefore be interpreted with caution and does not allow a definitive conclusion about revenue differences between the two groups.

From the perspective of enterprise management, the findings suggest that operational efficiency in the spa sector is achievable regardless of settlement type. The defining resource of the sector, access to natural healing sources, is distributed according to geological conditions rather than settlement hierarchy, and cannot be replicated through proximity to urban infrastructure. Strategic focus for managers of village-based enterprises should therefore be directed toward workforce utilization, service portfolio diversification, and the balance between insurance-reimbursed and self-paying demand, rather than toward the perceived disadvantages of a rural location. The comparable labor productivity of village-based enterprises relative to town-based ones indicates that this potential is already being realized in the current operating environment.

From the perspective of regional development policy, the results suggest that investment in rural spa tourism infrastructure can be economically justified on efficiency grounds. If village-based enterprises achieve comparable labor productivity to town-based ones, then policies supporting their capacity expansion may represent an effective strategy for reducing spatial economic disparities without sacrificing operational performance. Conversely, the finding that scale is the primary driver of revenue differences raises a question for policymakers: whether the smaller average size of village-based enterprises reflects structural constraints, such as limited access to capital, ownership fragmentation, or lower demand, that could be addressed through targeted support mechanisms.

This study, however, has several limitations that should be acknowledged. The analysis is based on a single reference year (2024), which precludes any assessment of temporal dynamics or the stability of the observed patterns over time. The population of 28 enterprises, while complete, is small in absolute terms and limits the statistical power of the tests applied, as reflected in the inconclusive result for revenues. The study further relies exclusively on financial reporting data, which does not capture qualitative dimensions of enterprise performance such as service quality, client satisfaction, or strategic orientation. Finally, the binary classification of enterprises as town- or village-based represents a simplification of a more complex spatial reality, as enterprises within the same category may differ substantially in their accessibility, catchment area, and competitive environment.

CONCLUSION

This study examined whether the settlement type of a spa enterprise´s location, town or village, is associated with significant differences in revenues, employment, and labor productivity among all 28 certified natural healing spa enterprises operating in Slovakia in 2024. The results consistently indicate that labor productivity does not differ significantly between the two groups, while differences in revenues and employment, where observable, reflect differences in enterprise scale rather than location-specific competitive advantages. The dominant finding is that enterprise size, as captured by the strong correlation between revenues and employment (r = 0.97), is the primary structural determinant of revenue differences in the Slovak spa sector, and that this relationship holds across both settlement types. The principal contribution of this study is empirical evidence that spatial disparities in the Slovak spa sector are driven by scale rather than by location. This finding has direct implications for both enterprise strategy and regional development policy: village-based spa enterprises achieve comparable operational efficiency to their town-based counterparts, which suggests that the economic potential of rural spa tourism is not structurally limited by settlement type. Supporting the growth of village-based enterprises in terms of capacity and client base diversification may therefore represent a more effective use of public resources than concentrating investment in already larger establishments. Future research could address the limitations of this study by extending the analysis to multiple years to examine whether the observed patterns are stable over time, incorporating additional performance indicators beyond revenues and employment, and exploring the role of ownership structure, specialization, and client composition in explaining within-group heterogeneity. Applying a comparable analytical framework to spa sectors in other Central European countries operating under similar regulatory conditions (for example Czechia) would also enable cross-national comparisons and contribute to a broader understanding of how institutional and spatial factors shape enterprise performance in health tourism.

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