

**THE ANALYSIS OF THE ECONOMIC EFFICIENCY
OF REGIONS ON THE LEVEL OF NUTS III
AND ON THE PROPORTION OF MUNICIPAL TAXATION**

Peter Adamišín, Juraj Tej*

Abstract: Also the municipalities in the Prešov region were hit by the global economic and financial crisis. In this paper we analyze how the change of economic performance and subsequent revenue shortfall in the municipal influences the rates of individual components of real estate tax. The analysis was conducted in the region of Prešov in all district cities, using the average monthly wage of population, unemployment rate as indicators of economic performance and the changes of selected real estate tax rates.

Keywords: crisis, local taxes, price, changes in tax rates, standard of living, real estate tax.

JEL Codes: H20,H60, H87

Introduction

European Charter of Local Self-government expressed in the European context, that own revenue base of municipalities is the basis of its economic integrity, while creating an economic sovereignty of the municipality's ability to pay their own expenses to meet local needs arising from the original functions of the village. States, that local authorities are entitled to their own financial resources with which they may dispose freely within their powers [15].

The financial and economic crisis has its direct impact on the state and the municipalities [11]. These are the effect on individual performance by the local authorities, particularly in terms of their financing and the subsequent economic stability. The crisis also limits the needs of residents in the area of public goods [2]. Most frequently presented problem is the instability and loss of tax revenue from personal income as a result of central tax, which equate to the municipality as a result of standardized redistribution processes. The crucial parts of municipality's revenue are government transfers and shared taxes, which criteria for the selection are made by the central government.

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Municipalities are trying to respond to this situation, solving its own revenue base, by measures to help them increase revenue for the performance of original powers. These are local taxes and fees [18]. Increasing rates of local taxes is for municipalities one (and often only one) way for government how to solve the problem. Of course with all the consequences of a possible decline in profitability in the growing rates and taking into account the average standard of living in the municipality as a pro-social approach of the municipal government.

Aim and Methodology

Municipalities have in period of financial and economic crisis only limited the possibilities for autonomous control of the income amount by their own tax and financial policy. Even though, this method is intensively used by many municipalities. The aim of the analysis, which contained a summary of the contribution, was to verify the assumption, if there is relationship between economic development of regions and the level of taxation on local taxes in terms of real estate tax. Based on the assumption that the level of local taxes should reflect the economic status of the region and also the economic situation of its population and localized of business entities. Lower economic performance of the district with lower tax of local taxes could create more favorable business environment for regional development. So municipalities have effective tool for shaping the economic environment in its region, respectively creating a competitive environment against other regions.

To assess the economic performance of regions at NUTS III level were selected indicators of the average monthly wage and the unemployment rate for 2010. (For evaluate the economic performance of regions would be more appropriate indicator of per capita GDP of the region, but the Statistical Office as an official institution for the collection and presentation of macroeconomic data since 2001 doesn't publish regional GDP data). Observed indicators (average monthly wage and unemployment rates) represent value for whole NUTS III region and analyzed taxes of the central residences of regions. As the district towns (central settlements) of districts (NUTS III) are the dominant subjects of economic activities of the whole region NUTS III, in the analysis of parametric values for the seemingly different entities (cities and districts) there is no significant deviations of the results. Objectification of the results is ensured by applying of standardized statistical procedures based on statistical induction. The analysis was realized in all regions of the NUTS III Prešov region (NUTS II), analyzed Prešov region has 13 districts. Local taxes, which were the subject of research are tax on arable land, vineyards and orchards, the tax on built-up area and courtyard, a tax on building land, tax on buildings for housing, tax on recreational buildings and gardeners cottages; tax on industrial buildings serving

energetics, building industry and administration. Municipalities can greatly affect these taxes and they have the highest income share from them.

Analytical procedures that we select for the verification of our assumptions were cluster analysis, correlation analysis and simple comparison to the average. Testing of normality revealed that in two of parameters can not be said that they have a normal distribution: tax on buildings for housing; tax on industrial buildings serving energetics. Analysis of connections in these cases was performed by non-parametric tests. Data for analysis were obtained from official sources of Statisticam Office of Slovak Republic. Processing was realized by using statistical software SPSS and trial versions of software NCSS and Systat.

Results and discussion

If we follow the development of the early signs of economic and financial crisis in Slovakia in 2009, the balance sheet of municipal budgets revenue proposed by the state closing account of the SR can be seen in Table 1.

	million SKK	million €
Income tax and capital property tax	36 355,1	1 206,8
from that: individual tax income	36 355,1	1 206,8
Prperty tax:	7 676,5	254,8
from that: real estate tax	7 676,5	254,8
- land tax	2 078,5	69,0
- tax on buildings	5 255,2	174,4
- tax on housing and non-housing space	342,8	11,4

Table 1 Municipal tax revenue in 2009

Source: [1]

Property taxes are the most common type of local taxes. Share of their revenue to GDP across countries is relatively small - Austria 0,1 %, Netherlands 0,3 %, France 1,5 % [8]. We don't need to make illusions about their prospective growth as seen by many municipalities.

Development of tax revenues may be considered as positive. We can see significant impact of fiscal decentralization, which in same time caused shrinking share of non-tax revenues, which resulted that municipalities stopped actively influence them. Comparison of this process within the time period can be seen in Table 2.

	2002	2003	2004	2005	2006	2007	2008	2009
Tax revenues	16 891,0	17 798,4	19 737,0	36 453,2	40 793,8	43 444,2	50 770,4	48 813,3
Non-tax revenues	11 864,5	13 103,4	7 638,7	8 224,2	3 912,9	4 180,9	4 693,3	4 779,7
Share (%)	70,2	73,6	38,7	22,6	9,6	9,6	9,2	9,8

Table 2 Tax and non-tax revenues of municipalities (mil. SKK)

Source: [1]

According to a survey carried out by the Slovak Business Alliance average rates of property taxes in Slovakia in 2010 as compared to the year 2004 about twice as high, when their amount was determined by state and was tax rates before the tax reform [14]. When comparing the rates of real estates taxes in 2009 and 2010, we find that in some areas (84 districts and the city parts of Bratislava) decreased on average by 0,71 %. In 46 districts, the tax rates have not changed at all. The current unfavorable economic development in the income of municipalities is permanently affected by the financial crisis and the shortfall of share of personal tax income. It is therefore incomprehensible in terms of economic point of view stagnation in the development of tax rates in 2010. We assume that this causes an election year for representatives of municipal authorities, who decided to pass this burden on future municipal leaders, including themselves. Including themselves because that not solving the shortfalls through higher rates of individual actors of management revenue base of municipality, the chance of municipal management officials re-election is growing.

Municipalities took active role in the regulation of tax rates and fees. Much less active municipalities joined to nature management of its assets, which could express significantly in the amount of revenue from the economic implementation of its assets [10]. Taxation of property is often understood as a form of social regulation of uneven distribution of wealth in society [3]

In examining the impact of the financial and economic crisis on management of revenue base of municipalities in relation to tax revenues, especially in the areas of real estate tax in the Prešov region are based on the assumption that:

- municipalities perceive real estate tax as an important source of income, which can solve their own revenue base;
- municipalities behave prosocial and perceive in the time of crisis an increased tax burden of taxpayers in real estate tax as unethical and won't be using this fiscal instrument sufficiently;
- municipalities determine the rates of real estate tax based on the perceived standard of living of taxpayers, local policy actors. [13]

Cluster analysis

Region districts were analyzed according to the degree of similarity of selected parameters. Cluster analysis was realized separately for the set of economic indicators and independently for set of tax indicators.

Analysis of economic parameters (the average wage and the unemployment rate), we obtained the following dendrogram (Figure 1).

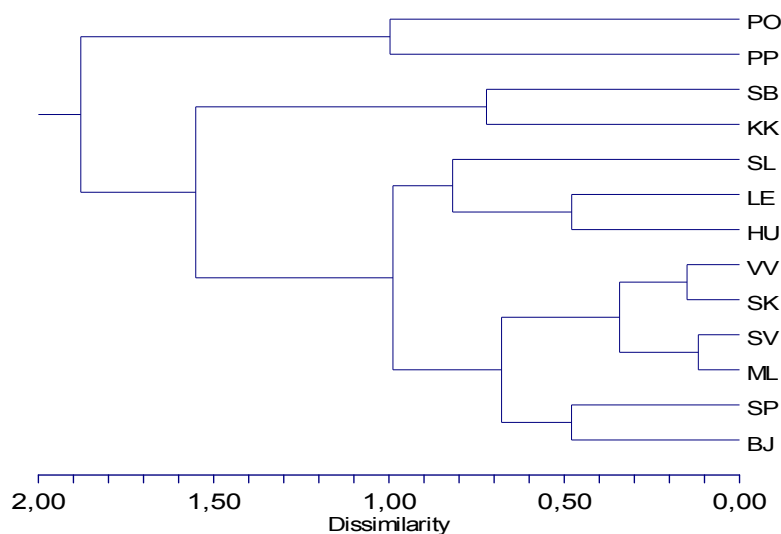


Figure 1 Results of the clusters according to economic indicators

Source: own research

Legend: Okresy: BJ – Bardejov, HU – Humenné, KK – Kežmarok, LE – Levoča, ML – Medzilaborce, PO – Prešov, PP – Poprad, SB – Sabinov, SK – Svidník, SL – Stará Ľubovňa, SP – Snina, SV – Stropkov, VV – Vranov.

Based on figure 1 we can identify three major clusters of districts. The first cluster is represented by Prešov (PO) and Poprad (PP) districts. Those districts that are economically most powerful regions of the Prešov region (Prešov is the economic and administrative seat of Region, Poprad is one of the top tourist destinations in Slovakia). The second cluster is represented by districts Sabinov (SB) and Kežmarok (KK), districts which border on districts from first cluster, while in recent history before the last change of territorial-administrative division they were part of these districts. Third cluster consists of all other parts of the region (or taking into account the index value and validity RMSSTD CHF cluster can be divided into two parts: doistricts Stará Ľubovňa, Levoča a Humenné in one cluster and the rest in the second cluster).

Value of cophenetic correlation coefficients ($CC = 0,829$), refers only lower quality of acquired cluster (clustering method: group avarage, unweighted pair-group, the Euclidean distance methods).

Analysis of the districts similarity according to the indicators of the tax burden by local taxes gives the following results (Figure 2).

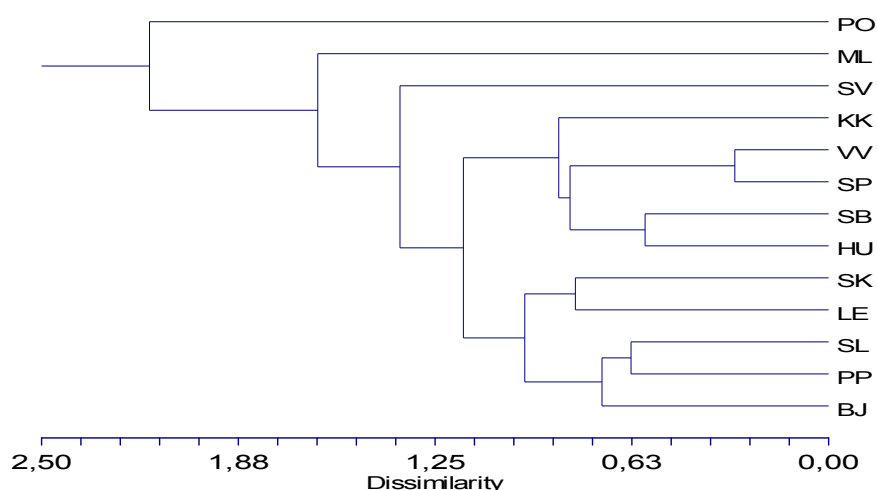


Figure 2 Results of the clusters according to tax indicators

Source: own research

Legend: Okresy: BJ – Bardejov, HU – Humenné, KK – Kežmarok, LE – Levoča, ML – Medzilaborce, PO – Prešov, PP – Poprad, SB – Sabinov, SK – Svidník, SL – Stará Ľubovňa, SP – Snina, SV – Stropkov, VV – Vranov.

Based on the characteristics of CHF and DB validity indices is in this case appropriate to consider the three clusters of districts. Other values of validity indices brought the multivalent results of clusters numbers. Value of cophenetic correlation coefficient ($CC = 0.865$) shows a slightly higher quality of the cluster than in the clustering of districts according to selected economic parameters.

Detailed analysis of the dendrogram find that some of the districts show too high value of noncongeniality with other districts. In this a case it would be appropriate for these districts Presov (PO), Medzilaborce (ML) and Snina (SV) to be excluded, and consider only two clusters with a higher representation of districts. Heterogeneity of the districts in this clustering was one of the reasons of ambiguous values of validity indexes.

By comparison of the obtained dendrogram, we cannot say that groups of districts with similar economic development (measured by given indicators) are producing similar clusters than districts with similar levels of local taxes taxation.

We made comparison of economic development and tax rates level also by through the deviations from average values. This analysis has a higher degree of generalization, because it is only based on the categorization of above-average

and below average values, no further mutual interactions between the values. The results of the analysis can be seen in Table 3.

District	1	2	3	4	5	6	7	8
Bardejov	-	-	+	+	-	+	+	+
Humenné	+	+	-	+	-	-	-	-
Kežmarok	+	-	-	-	-	+	+	-
Levoča	+	+	-	-	+	+	+	-
Medzilaborce	-	-	-	-	-	-	-	-
Poprad	+	+	-	+	+	+	+	+
Prešov	+	+	+	+	-	+	+	+
Sabinov	-	-	-	+	-	+	-	-
Snina	-	-	-	+	+	-	+	+
S. Ľubovňa	-	+	-	+	+	-	+	-
Stropkov	-	+	+	-	-	+	-	-
Svidník	-	-	+	+	+	-	+	-
Vranov n/T	-	-	+	-	-	+	-	-

Table 3 Comparison of values of economic and fiscal indicators in relation to the average for Prešov region

Source: own research

Legend: 1 – average monthly wage, 2 – unemployment rate., 3 - tax on arable land of vineyards and orchards, 4 - tax on built-up areas and courtyards, 5 - tax on building land, 6 - tax on buildings for housing, 7 - tax on recreational buildings and gardeners cottages, 8 - tax on industrial buildings serving energetics, building industry and administration.

Positive values indicate above-average values followed indicator. Average value was data from all the districts of Prešov region. For better

comparability we reversed the data of the unemployment rate parameter. From the results it is obvious that the economically most developed districts of the region are HU, LE, PP, and PO, which achieved above-average values in both monitored economic parameters. On the other hand there is a big group of districts (total 6), which are below average in both monitored economic indicators. Economic development, respectively underdevelopment of the region, does not correspond with the level of the tax burden on local taxes. The assumption that the economically less active districts will apply a lower level of taxation is not obvious from the analysis. Conversely, in the region there are several districts that are economically below-average but have above-average level of taxation in nearly all monitored taxes (eg, BJ, SV), used most likely to increase the revenue base of budget. In contrast, we can identify economically above-average districts with average or below-average rate of taxation (LE, HU), probably due to the reduction of the tax burden to entities as real estate tax payers.

Neither the results of this analysis do indicate a causal relationship between economic performance of regions and the level of the tax burden on local taxes.

Last analytical tool we applied to find a causal link between regions and economic maturity level of taxation is the correlation analysis. As mentioned, for some indicators has not been confirmed normality of distribution so correlation analysis is realized using Pearson and Kendall's coefficient.

Parametric test results can be seen in Table 4.

		1	2	3	4	5	7
1	<i>Pearson Correlation</i>	1	-0,246	-0,052	0,177	-0,132	0,339
	<i>Sig. (2-tailed)</i>		0,418	0,867	0,563	0,667	0,257
	<i>N</i>	13	13	13	13	13	13
2	<i>Pearson Correlation</i>	-0,246	1	-0,266	-0,189	-0,166	-0,203

	<i>Sig. (2-tailed)</i>	0,418		0,379	0,535	0,587	0,505
	<i>N</i>	13	13	13	13	13	13
3	<i>Pearson Correlation</i>	-0,052	-0,266	1	0,473	0,132	0,435
	<i>Sig. (2-tailed)</i>	0,867	0,379		0,103	0,668	0,137
	<i>N</i>	13	13	13	13	13	13
4	<i>Pearson Correlation</i>	0,177	-0,189	0,473	1	-0,016	0,506
	<i>Sig. (2-tailed)</i>	0,563	0,535	0,103		0,958	0,078
	<i>N</i>	13	13	13	13	13	13
5	<i>Pearson Correlation</i>	-0,132	-0,166	0,132	-0,016	1	0,350
	<i>Sig. (2-tailed)</i>	0,667	0,587	0,668	0,958		0,241
	<i>N</i>	13	13	13	13	13	13
7	<i>Pearson Correlation</i>	0,339	-0,203	0,435	0,506	0,350	1
	<i>Sig. (2-tailed)</i>	0,257	0,505	0,137	0,078	0,241	
	<i>N</i>	13	13	13	13	13	13

Table 4 Analysis of the links between selected parameters of economic performance and the level of the tax burden (parametric test).

Source: own research and calculations of authors

Legend: 1 – average monthly wage, 2 – unemployment rate, 3 - tax on arable land of vineyards and orchards, 4 - tax on built-up areas and courtyards, 5 - tax on

building land, 6 - tax on buildings for housing, 7 - tax on recreational buildings and gardeners cottages.

Based on results achieved can be argued that the economic development of regions (NUTS III) measured by indicators of the average wage and the level of unemployment, is not related to the level of the tax burden on local taxes. The results are even more obvious when displayed graphically (Annex 1).

We made similar conclusion also in the analysis regarding those types of local taxes, which we reject the normality of distribution (Table 5).

Correlations

	6	8	1	2	3	4	5	7
6 <i>Correlation Coefficient</i>	1,000	0,066	0,132	0,237	0,309	0,069	-0,218	0,184
<i>Sig. (2-tailed)</i>	.	0,758	0,538	0,268	0,155	0,754	0,320	0,389
<i>N</i>	13	13	13	13	13	13	13	13
8 <i>Correlation Coefficient</i>	0,066	1,000	0,116	-0,219	0,158	0,504*	0,213	0,426*
<i>Sig. (2-tailed)</i>	0,758	.	0,582	0,299	0,461	0,021	0,323	0,044
<i>N</i>	13	13	13	13	13	13	13	13

Correlations

	6	8	1	2	3	4	5	7
6 <i>Correlation Coefficient</i>	1,000	0,066	0,132	0,237	0,309	0,069	-0,218	0,184
<i>Sig. (2-tailed)</i>	.	0,758	0,538	0,268	0,155	0,754	0,320	0,389
<i>N</i>	13	13	13	13	13	13	13	13
8 <i>Correlation Coefficient</i>	0,066	1,000	0,116	-0,219	0,158	0,504*	0,213	0,426*
<i>Sig. (2-tailed)</i>	0,758	.	0,582	0,299	0,461	0,021	0,323	0,044
<i>N</i>	13	13	13	13	13	13	13	13

Table 5 Analysis of the links between selected parameters of economic performance and the level of the tax burden (nonparametric test).

Source: own research and calculations of authors

** Correlation is significant at the 0.05 level (2-tailed)*

Legend: 1 – average monthly wage, 2 – unemployment rate., 3 - tax on arable land of vineyards and orchards, 4 - tax on built-up areas and courtyards, 5 - tax on building land, 6 - tax on buildings for housing, 7 - tax on recreational buildings and gardeners cottages, 8 - tax on industrial buildings serving energetics, building industry and administration.

Significant values of correlation analysis in this case were showed only between selected local taxes themselves, not in relation to economic performance of regions.

Conclusion

Based on those conclusions, we can conclude that the NUTS III do not adjust tax policy to their own economic situation. Economic performance or inefficiencies of regions is not the factor that determined municipal tax policy. We cannot evaluate this fact positively because:

- regions (NUTS III) are not sufficiently using one of the autonomous instruments for influencing regional development;
- representatives of cities as well does not prefer replenishment of income budgets loss, reducing the tax burden of citizens and businesses by real estate taxes.

Nevertheless, based on the analysis it can be argued that the district towns in 2010, responded only very weakly to the economic and financial crisis in relation to real estate tax. Local politics dealt more with the issue of following electoral year than the question of increasing revenue of the general budget, or pro-social empathy. Applied tax policy is determined by other, probably hardly identifiable and quantifiable factors (e.g. political interests, lobbying ...) and in this case it is not used to stimulate regional economic growth.

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ANALIZA EFEKTYWNOŚCI EKONOMICZNEJ REGIONÓW POZIOMU NUTS III W PROPORCJI DO OPODATKOWANIA MIEJSKIEGO

Abstrakt: Także w Presowie, gminy zostały dotknięte przez globalny kryzys gospodarczy i finansowy. W niniejszym artykule przeprowadzona została analiza jak zmiana wydajności gospodarczej, a następnie niedobór dochodów w kasie miejskiej wpływa na

ceny poszczególnych elementów podatku od nieruchomości. Analizę przeprowadzono w regionie Presov, we wszystkich miastach powiatowych, przy użyciu przeciętnego, miesięcznego wynagrodzenia ludności i stopy bezrobocia jako wskaźników gospodarczych oraz zmian wybranych stawek podatkowych od nieruchomości.

关于NUTS-III 区域的经济效益水平和市政税收比例的分析

摘要: 在Prešov

地区的各个区县受到全球经济和金融危机的影响。在本文中,我们分析了

经济运行情况的变化和随后市政收入的不足对房地产税的各个组成部分利率的影响。这项

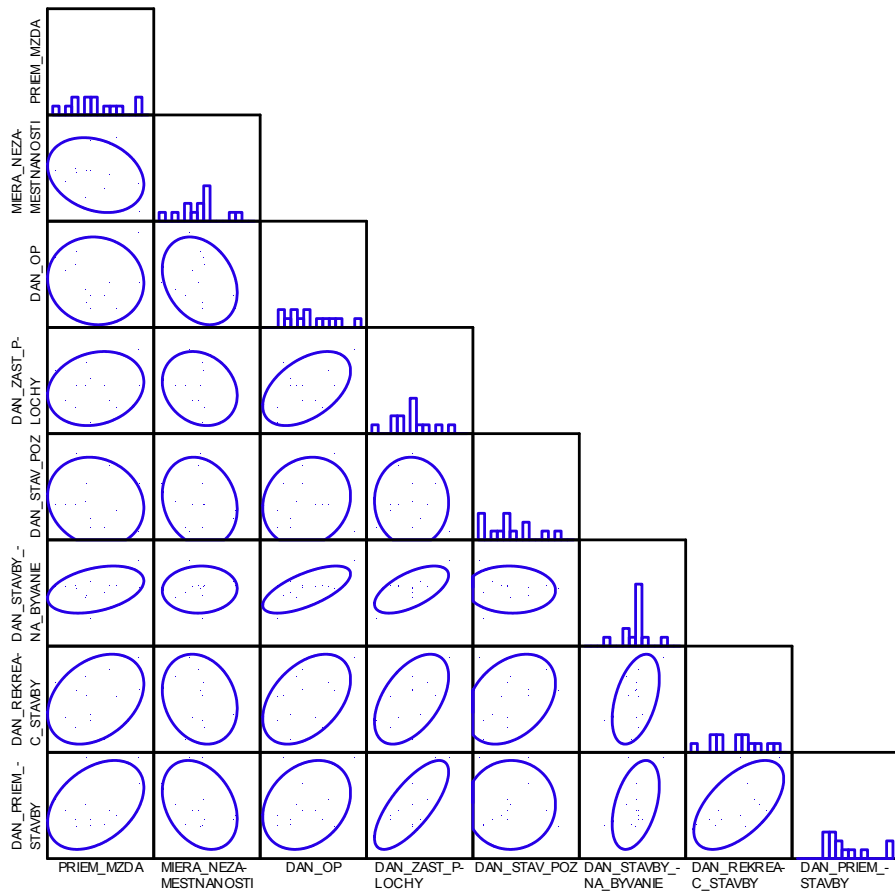
分析在Prešov

地区的各个城市进行,研究了人均月工资、作为经济运行情况指标的失业率

以及选定的房地产税的变化。

Annexes

Annex 1 Graph matrix of correlation connections



Annex 2: The values of analyzed economic and fiscal parameters for the NUTS III (data for 2010)

		Average monthly wage	unemployment rate	Tax on arable land of vineyards and orchards	Tax on built-up areas and courtyards	Tax on building land	Tax on buildings for housing	Tax on recreational buildings and gardeners cottages	Tax on industrial buildings serving energetics, building industry and administration
		€	%	sadzba (€. <i>m</i> ²)	sadzba (€. <i>m</i> ²)	sadzba (€. <i>m</i> ²)	sadzba (€. <i>m</i> ²)	sadzba (€. <i>m</i> ²)	sadzba (€. <i>m</i> ²)
Bardejov	BJ	506	19,43	0,0015	0,0278	0,1766	0,1660	0,5320	1,6600
Humenné	HU	610	15,66	0,0009	0,0232	0,1162	0,1500	0,2330	0,8810
Kežmarok	KK	635	26,18	0,0007	0,0162	0,1626	0,1700	0,4600	1,1600
Levoča	LE	620	18,41	0,0011	0,0186	0,2788	0,1700	0,6000	1,3300
Medzilaborce	ML	581	19,4	0,0007	0,0116	0,1162	0,0664	0,3319	0,8298
Poprad	PP	683	10,65	0,0011	0,0232	0,2324	0,1650	0,4970	2,1570
Prešov	PO	682	16,6	0,0019	0,0345	0,1062	0,2500	0,6630	2,9870
Sabinov	SB	580	25,71	0,0009	0,0255	0,1394	0,1820	0,3650	1,0290

Snina	SV	572	19,38	0,0008	0,0302	0,232 4	0,139 0	0,4650	2,9870
S. Lubovňa	SL	571	13,63	0,0010	0,0232	0,185 9	0,132 0	0,5640	1,4930
Stropkov	SP	528	17,14	0,0013	0,0186	0,176 6	0,166 0	0,3485	1,3278
Svidník	SK	552	18,8	0,0016	0,0232	0,310 4	0,160 0	0,4900	0,8200
Vranov n/T	VV	550	19,68	0,0014	0,0162	0,176 6	0,170 0	0,3000	1,0300

Source: ŠÚ SR