Chapter 3
Methodology

Formation of the indicators

The core of this project is a comprehensive comparative model of Slovak districts based on available statistical data and findings of the *Survey of entrepreneurs' and municipality representatives' opinions.* The aim of this chapter is to familiarize the reader with procedures used for data collection and principles of their processing, with the development of indicators including their weight setting, formulation of survey questions and finally with the categorization of the indicators and the formulation of the Regional Business Environment Index (RBEI) itself. The second part of this chapter lists all 106 indicators entering the calculation of RBEI, including their detailed description and selected information.

Data collection

In the preparatory phase of the project we collected all the statistical data available at the district level. The data were initially drawn from the Database of regional statistics of the Statistical Office as well as from the websites of individual ministries, government offices and other institutions. With an assumption that information collected at the regional level could also exist at the district level, we then addressed relevant institutions by e–mail.

Subsequently, we sorted the data according to their impact on business environment. We discarded low–quality data and those of little informative value and kept all relevant data, including those with a relatively small impact on the business environment. The smaller the impact of the data, the less weight it would receive in later stages of the index development.

In the next phase we focused on creating a comprehensive list of all the factors that affect business conditions. For most of these factors we obtained statistics that described them satisfactorily – the final selection featured 92 sets of data. For the remaining areas that were not covered by available statistics we formulated appropriate questions that later became the backbone of the survey administered to Slovak entrepreneurs and municipality representatives. We tried to compile a survey covering all relevant areas affecting business conditions that would be as plain and clear as possible. This process resulted in the survey consisting of 47 questions, where each question verbally defined two extreme responses that represented the worst and the best possible state in the evaluated area. Respondents could choose a response from a set {1, 2, 3, 4, 5, 6}, where circling {1} meant the worst possible condition and circling {6} meant the best possible condition.

Data transformation

A total of 92 sets of statistical data were selected for the model. Each set of data for each district could represent either simple data (e.g. registered unemployment rate), ratio data (e.g. inflow of foreign direct investments per capita), or index created on the basis of partial data (e.g. ageing index computed from the population in different age groups).

To enable comparison of incongruent data such as number of people per km^2 and registered unemployment rate measured as a percentage, it was necessary to devise a universal transformation method. Yet, variety of units was not the only problem. To make the data comparable, it was also necessary to make them equally scalable. Thus, the usage of a suitable transformation model can solve both problems simultaneously. All 92 sets of data are subject to transformation, while for most of them logarithmic transformation, which is commonly used in economics, proved to be the most appropriate. In other cases linear transformation was used. Regardless of the function applied, the transformation guarantees that its output for each district is the number in the interval [1; 6], for which we will hereafter use the term score. This feature of transformation ensures comparability of statistical data with data from the survey, as possible answers of respondents in the survey also come from the interval [1; 6].

The transformation procedure is applicable to any of 92 data sets, after establishing whether it logically conforms to a concave, linear, or convex utility function and whether it is appropriate to set lower and upper limits by the algorithm or by a reasonably determined value. The lower and upper limits should be set with respect to a theoretically achievable range of values in Slovak conditions. For example, urbanization may reach any value in the interval [0%; 100%], therefore it reasonably defines both boundaries. However, in the case of life expectancy, we can not speak of a coherent theoretical minimum or maximum, so, for the purpose of transformation, these values should be determined by the algorithm.

The last step of the transformation process ensures that a higher score will always represent better conditions in the district. Indeed, for some data, such as unemployment rate, a higher value represents an undesirable situation. In this case, transformation ensures that districts with lower unemployment rate will be assigned higher scores and vice versa. It should also be noted that not every set of data must contain values for all districts. In such a case, the missing data are not included in the calculations and the district has no associated score. In the following paragraphs the actual process of transformation is described in detail, accompanied by an example with population density of selected districts and illustration of selected procedure.

Creation of the score

Let n be the number of districts with the data available for their particular set and the corresponding districts be 1, 2, 3, ..., n. Let x_i be a value that i–th district has reached.

1. Determination of lower bound L and upper bound U for theoretically achievable values x_i. It is obvious that $L \leq \min x_i$ and $U \geq \max x_i$. Let sort the values x_i from the smallest to the largest and name them y_i, $i = 1, 2, 3, ..., n$. If values of y_i for i close to n are increasing rapidly, U must have „sufficient reserve" from value y_n. U must therefore take into account the increase in y_i and as i converges to n, the weight of this increase has to grow. A similar methodology can also be used to calculate L. Thus

$$L = y_1 - \frac{\sum_{i=1}^{n-1}\left(\frac{4}{5}\right)^i \left(y_{i+1} - y_i\right)}{\sum_{i=1}^{n-1}\left(\frac{4}{5}\right)^i}$$

$$\tag{1}$$

$$U = y_n + \frac{\sum_{i=1}^{n-1}\left(\frac{4}{5}\right)^{n-i} \left(y_{i+1} - y_i\right)}{\sum_{i=1}^{n-1}\left(\frac{4}{5}\right)^{n-i}}$$

2. Normalizing values x_i on the interval [0,1]. If we define normalized values of x_i as x_i', then

$$x_i' = \frac{x_i - L}{U - L} \tag{2}$$

3. Transformation of normalized values x_i' of particular data set into new values x_i'' based on the character of utility function using such a transformation function $x'' = f\left(x'\right)$, that f represents utility function and satisfies the condition $f\left(.\right) : \left[0,1\right] \mapsto \left[0,1\right]$.

If utility function of the data set is linear, then

$$f(x') = x'$$

otherwise

$$f(x') = \log_k\left(1 + \left(k - 1\right)x'\right) \tag{3}$$

where k is set in such a manner that $f'\left(0\right)$ reflects sharpness of distribution of x' as follows: if the utility function is concave,

$$\frac{k - 1}{\ln k} = \left(\frac{\overline{x} - \min\limits_{i \leq n} x_i}{\max\limits_{i \leq n} x_i - \min\limits_{i \leq n} x_i}\right)^{-\frac{3}{2}} \tag{4a}$$

if the utility function is convex,

$$\frac{k - 1}{\ln k} = \left(\frac{\overline{x} - \min\limits_{i \leq n} x_i}{\max\limits_{i \leq n} x_i - \min\limits_{i \leq n} x_i}\right)^{\frac{3}{2}} \tag{4b}$$

It should be noted that for any $x' \in \left[0,1\right]$, the transformation for linear utility function is well defined from the logarithmic utility function, since

$$\lim_{k \to 1} \log_k\left(1 + \left(k - 1\right)x'\right)$$

$$= \lim_{k \to 1} \frac{\ln\left(1 + \left(k - 1\right)x'\right)}{\ln k}$$

$$= \lim_{k \to 1} \frac{\frac{\partial \ln\left(1 + \left(k - 1\right)x'\right)}{\partial k}}{\frac{\partial \ln k}{\partial k}}$$

$$= \lim_{k \to 1} \frac{\frac{x'}{1 + \left(k - 1\right)x'}}{\frac{1}{k}}$$

$$= x'$$

4. Creation of the final score of particular data set for all districts. If the data set is „positive", i.e. increase in the values results in a better quality of businesses environment, the final score s_i of particular data set for district i is defined as

$$s_i = 1 + 5x_i'' \tag{5}$$

If the data set is negative,

$$s_i = 6 - 5x_i'' \tag{6}$$

Application of presented transformation process on any particular set of data ensures invariance of the achieved score under linear transformations of these data – shifts or multiplications. In other words, if for example, the rate of unemployment in all districts falls equally by one percentage point per year (shift), or charges for municipal waste halve (multiplication), the scores in these indicators achieved in all districts do not change.

This invariance is ensured by equations (1) and (2), thus values of x' do not change regardless of any shifts or multiplications of original data.

How the transformation affects different sets of data

Transformation of the source statistical data to the range from 1 to 6 is necessary for a fair district assessment. The following charts show the impact of universal transformation of the data coming from different distributions. For each type of distribution, the graph on the left side shows the original distribution of data that corresponds to their statistical indicator, the graph on the right side represents the score achieved by individual districts after applying an appropriate transformation. In all cases shown, we used a concave utility function, since a linear function fully transforms the shape of the original data into the final scores and the transformation would be meaningless.
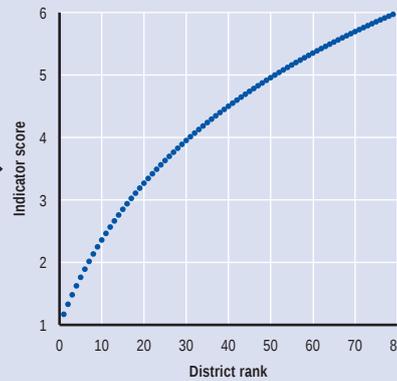
Uniform distribution, which following the sorting of data looks like an approximately linear line, is typical for indicators with a kind of natural lower and upper boundary – such as agricultural land as a proportion of total area of the district.
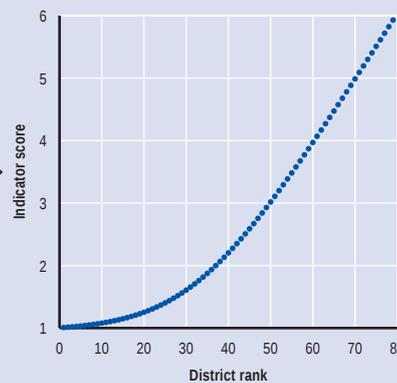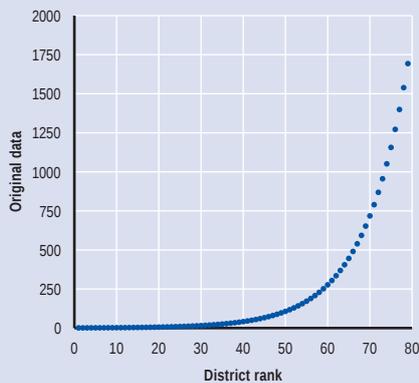
Exponential distribution, represented by an approximately exponential curve with decreasing density of data, is typical for most indicators with the lower boundary set and the upper boundary open – such as air pollution.
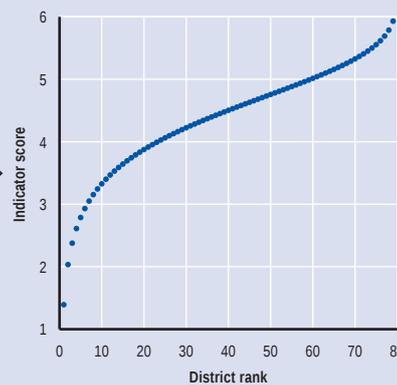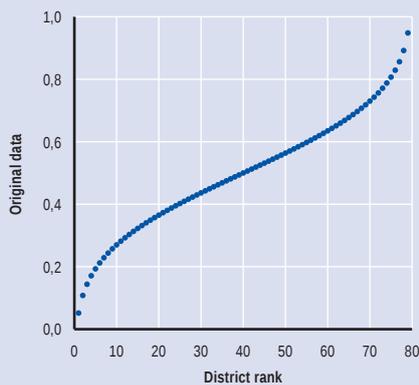
Graph of ordered realisations from a normal distribution is typically center–symmetric and has tails at both ends. Such distribution is characteristic of the indicators with some kind of mean value and possible deviations on both sides – such as net migration.
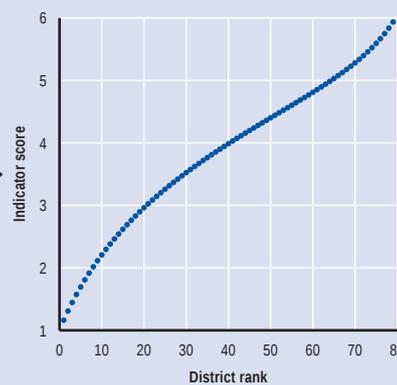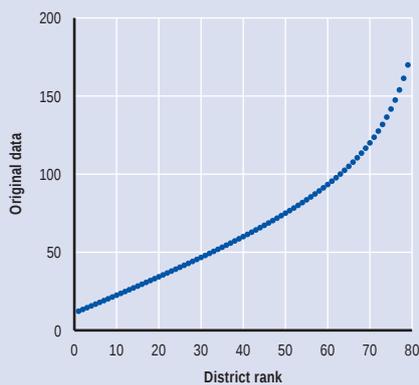
This graph does not directly represent any standard statistical distribution, but there are many indicators consisting of such data – for example, social benefit claims, level of industry development or registered unemployment rate.

Example of transformation – population density

It can be assumed that increasing population density improves conditions for business activity in the district. But as the population density grows, each its additional unit increase has a smaller contribution to business conditions imporvemnt than the previuous one. It follows that the utility function of such indicator is concave and that it is appropriate for that set of data to apply logarithmic functions when transforming original values. L and U boundaries are to be set by the algorithm, since they cannot be determined arbitrarily based on the assumption of a possibly unpopulated district or a district with certain maximum population density.

The necessity of applying a logarithmic function to transform the original values can be well illustrated by the fact that the population density of districts within the SR is very diverse, especially in the urban districts of the cities of Bratislava and Košice. If we did not use logarithmic transformation on the data, only the Bratislava I District would achieve a high score, other urban districts would achieve a relatively low score and finally all other districts would achieve scores close to the lowest possible. The Žilina District would, therefore, not benefit from the fact that it has almost seven times greater population density than the Medzilaborce district. Usage of appropriate logarithmic transformation eliminates this effect.

Data on population density are available for all Slovak districts. We know that $n = 79$ and $x_1, ..., x_{79}$ are population densities of individual districts. After sorting the data to obtain vector $(y_1, ..., y_{79})$, where $y_1 = 28.33$ and $y_{79} = 4,278.62$ and after applying equations (1), we get boundaries $L = 24.57$ and $U = 4,922.56$. The properties of population density show that this set of data will constitute the final score according to equation (5). Equation (4a) for concave utility function gives $k = 503.09$ and by applying equations (2), (3) and (5) we finally calculate the score for all districts. The overview of the scores assigned to selected districts is shown in the table.

District	Population density (inhabitants / km²)	Score	Score without transformation
Bratislava I	4,278.62	5.89	6.00
Košice III	1,767.28	5.17	3.05
Bratislava II	1,209.18	4.86	2.39
Košice I	788.27	4.51	1.89
Žilina	193.88	3.34	1.19
Poprad	94.55	2.69	1.08
Liptovský Mikuláš	54.65	2.13	1.03
Medzilaborce	28.33	1.26	1.00

Creation of weights and indicators

Not all the statistical data are equally important in shaping business conditions. It is evident that the inflow of foreign direct investments has a more fundamental impact on district's business conditions than for example the charges for municipal waste removal. It is therefore necessary that each data set be associated with appropriate weight, which reflects the influence of the factor on business conditions. These weights were assigned to all data sets by estimates of selected analysts and experts, while the total weight of all 92 statistical data sets is equal to 800.

In the next step, in order to clarify the model, some sets that describe the same area of business environment were aggregated into larger units. These larger units will be hereinafter referred to as indicators. As an example of such indicator we can mention a merger of four data sets concerning air pollution by oxides of carbon, nitrogen, sulfur and particulate emissions resulting in a single indicator measuring overall air pollution. It should be noted that in the process of data sets aggregation, the scores of all sets are taken into account, as averaging the original untransformed data may result in unit mismatch. This aggregation operates with the weights that were associated with the original data sets, therefore the score achieved in a composite indicator is equal to the weighted average of all scores assigned to the district within the original sets of statistical data and the resulting weight of this composite indicator is equal to the total weight of all the aggregated data sets.

The remaining sets of statistical data that were not merged created indicators individually. Each data set formed its own indicator with a weight equal to the weight of its underlying data set. These adjustments created a total of 59 statistical indicators from the original 92 sets of statistical data.

The Survey of entrepreneurs' and municipality representatives' opinions

As already mentioned in the introduction to this chapter, statistical data on the district level were not available for all factors affecting the business environment. In order to cover all these aspects as completely as possible, in addition to areas already covered with statistical indicators, we compiled a survey to obtain the remaining indicators affecting business environment, based on the entrepreneurs' and municipality representatives' opinions. This survey was conducted mainly in November 2009, delivered primarily to executives working in Slovak companies and mayors of Slovak municipalities with an aim to obtain data describing selected areas of business environment.

A total of 47 questions were created. The survey consists of closed questions with possible answers from the set of {1, 2, 3, 4, 5, 6}, where the responses 1 and 6 were given verbal meaning with opposite impacts on the business environment. Answers 2, 3, 4 and 5 represent intermediate stages between the two extreme views. Response 1 represents the most negative impact while response 6 represents the most positive impact on the business environment. In addition to the six possible views on each issue, the majority of questions was supplied by an additional scale with two possible

Consistency of respondents' opinions
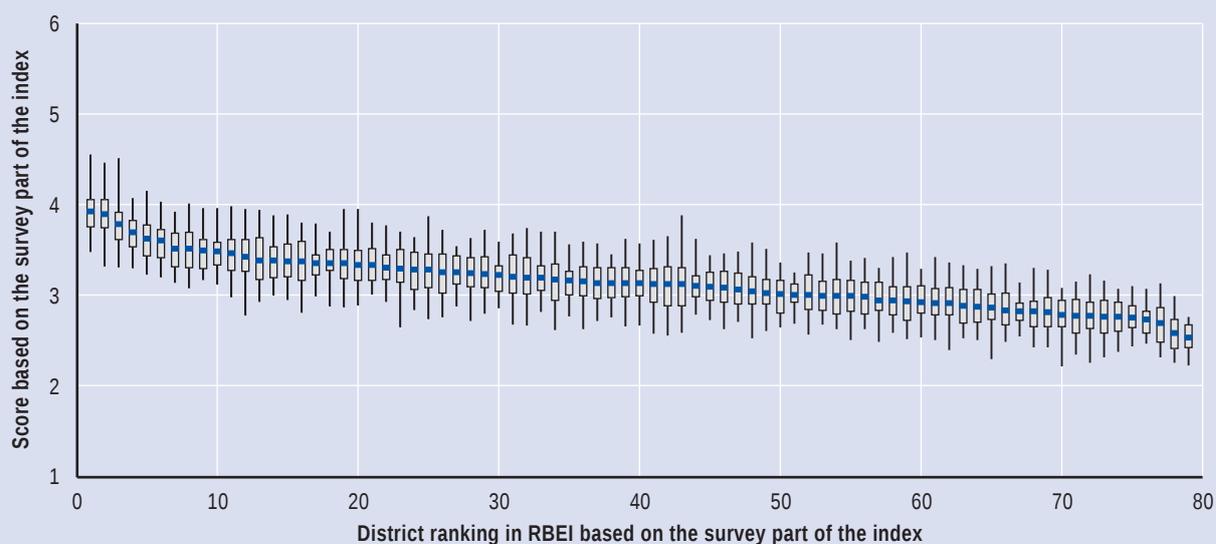
The difference between 95% and 5% quantiles of responses	Interquartile range – interval with the middle 50 % of the districts	District score based on the survey part of the index

	District	Score based on the survey	Number of respondents	Interquartile range	Standard deviation		District	Score based on the survey	Number of respondents	Interquartile range	Standard deviation
1	Bratislava II	3.92	178	0.30	0.27	41	Prievidza	3.13	104	0.37	0.34
2	Bratislava I	3.90	170	0.31	0.31	42	Martin	3.13	93	0.43	0.27
3	Bratislava V	3.79	116	0.30	0.38	43	Levice	3.12	63	0.42	0.28
4	Bratislava IV	3.69	89	0.29	0.25	44	Námestovo	3.11	45	0.23	0.30
5	Bratislava III	3.63	129	0.34	0.35	45	Nové Zámky	3.09	79	0.31	0.36
6	Trnava	3.61	109	0.31	0.34	46	Prešov	3.09	93	0.34	0.21
7	Malacky	3.53	50	0.37	0.31	47	Tvrdošín	3.07	46	0.34	0.34
8	Galanta	3.52	60	0.39	0.23	48	Spišská Nová Ves	3.05	78	0.30	0.33
9	Senec	3.50	61	0.32	0.36	49	Dolný Kubín	3.03	50	0.27	0.27
10	Dunajská Streda	3.49	68	0.25	0.31	50	Bánovce nad Bebravou	3.01	43	0.36	0.34
11	Nové Mesto nad Váhom	3.48	65	0.34	0.26	51	Stará Ľubovňa	3.01	57	0.20	0.32
12	Žilina	3.45	136	0.35	0.29	52	Brezno	3.01	54	0.38	0.36
13	Žarnovica	3.40	42	0.46	0.27	53	Michalovce	3.00	64	0.32	0.27
14	Ilava	3.40	59	0.34	0.29	54	Sobrance	3.00	44	0.38	0.32
15	Púchov	3.38	42	0.36	0.28	55	Partizánske	3.00	32	0.34	0.32
16	Trenčín	3.37	83	0.43	0.30	56	Medzilaborce	2.99	21	0.35	0.19
17	Skalica	3.36	48	0.22	0.23	57	Komárno	2.95	73	0.31	0.31
18	Hlohovec	3.35	40	0.23	0.24	58	Detva	2.94	51	0.31	0.34
19	Poprad	3.34	86	0.32	0.27	59	Krupina	2.93	32	0.37	0.25
20	Pezinok	3.34	65	0.33	0.33	60	Humenné	2.92	53	0.30	0.24
21	Liptovský Mikuláš	3.34	75	0.35	0.30	61	Rožňava	2.92	62	0.29	0.30
22	Šaľa	3.32	51	0.27	0.28	62	Čadca	2.91	63	0.30	0.34
23	Piešťany	3.30	74	0.36	0.30	63	Stropkov	2.90	36	0.37	0.25
24	Kysucké Nové Mesto	3.30	34	0.41	0.35	64	Lučenec	2.88	62	0.36	0.27
25	Ružomberok	3.28	55	0.37	0.41	65	Banská Štiavnica	2.88	38	0.28	0.39
26	Nitra	3.26	96	0.43	0.25	66	Kežmarok	2.84	49	0.35	0.35
27	Košice IV	3.26	65	0.31	0.22	67	Sabinov	2.84	38	0.19	0.31
28	Žiar nad Hronom	3.26	59	0.32	0.30	68	Svidník	2.83	41	0.28	0.28
29	Považská Bystrica	3.25	57	0.34	0.30	69	Bardejov	2.82	59	0.32	0.30
30	Myjava	3.22	45	0.28	0.35	70	Košice – okolie	2.79	53	0.29	0.30
31	Košice II	3.20	65	0.42	0.29	71	Revúca	2.79	47	0.37	0.34
32	Košice I	3.20	100	0.40	0.27	72	Vranov nad Topľou	2.78	59	0.29	0.28
33	Bytča	3.19	20	0.27	0.25	73	Trebišov	2.77	69	0.36	0.22
34	Senica	3.18	45	0.40	0.27	74	Rimavská Sobota	2.77	58	0.32	0.30
35	Zlaté Moravce	3.17	40	0.26	0.36	75	Snina	2.76	46	0.24	0.36
36	Turčianske Teplice	3.17	30	0.32	0.26	76	Poltár	2.75	25	0.24	0.25
37	Košice III	3.15	33	0.34	0.28	77	Levoča	2.70	31	0.38	0.33
38	Zvolen	3.14	74	0.33	0.27	78	Veľký Krtíš	2.59	47	0.32	0.32
39	Banská Bystrica	3.13	157	0.32	0.25	79	Gelnica	2.53	36	0.25	0.36
40	Topoľčany	3.13	50	0.28	0.31						

answers, where respondents evaluated the importance of that issue for the business environment.

Each question from the survey constitutes one indicator, hereinafter referred to as "survey indicator". The 59 statistical indicators were joined with 47 survey indicators to form a final set of 106 indicators. The score for each survey indicator for each district is calculated as the arithmetic mean of responses from all respondents to this question for a particular district. When calculating these scores, no transformation was used. It was not even necessary, given the questions in the survey were automatically constructed so that a higher average response represents better conditions in the district. Both statistical and survey indicators are therefore consistent – higher scores of any indicator always represent better business conditions. The consistency is also guaranteed by the fact that, in simple terms, it is approximately as difficult to achieve a score of 5.2 within a statistical indicator as to achieve a score of 5.2 within a survey indicator. These properties allow for meaningful comparisons and averaging of both types of indicators.

When determining the weights of survey indicators, the additional scale for each question plays an essential role. The weights of all indicators were subsequently fine–tuned by the analysts with the total weight of all 47 indicators being equal to 400.

Sample questions with their verbal meanings and explanations of each response from the set {1, 2, 3, 4, 5, 6} and the additional scale can be found at the bottom of this page. The exact wording of all 47 issues with possible answers can be found in the latter part of this chapter, along with summation, description and selected information on all 106 indicators entering the calculation of RBEI. This list also contains a histogram showing relative frequency of each possible response for each survey question.

Categorization of indicators and RBEI composing

A total of 106 indicators were prepared for the model, of which 59 came from the statistical data and the remaining 47 were collected from the opinion survey. Each of these indicators was assigned its own weight that reflected the influence of a particular indicator on the business environment. For better orientation in the set of indicators and in order to streamline the overall model, it proved suitable to classify individual indicators into larger logical units that describe wider areas of business environment. We identified eight such areas and defined them as the pillars of business environment. They are Economic environment, Economic output, Legislation, Public administration, Infrastructure, Technology, Human resources and Education. Each of the 106 indicators is clearly assigned to only one of these pillars. The district score in each pillar is calculated as a weighted average of all the indicators included in the pillar.

Eight pillars of business environment form pairwise four subindexes. The first and second pillar taken together make up the Economic activity subindex. The third and fourth pillar constisute a subindex called Public administration and legislation. Combining the fifth and sixth pillars creates a Technology and infrastructure subindex. The last two pillars form Education and Human Resources subindex. District score achieved in each subindex is calculated similarly to the score of the pillars, in this case taking into account all the indicators that fall under either of the pillars of the appropriate subindex. Finally, the weighted average of all 106 indicators gives us the Regional Business Environment Index itself. If any district does not have all statistical data available and thus has not been assigned a score for a particular indicator, this indicator has not been taken into account in the calculation of RBEI; the weighted average is calculated only from the indicators defined for that district and the sum of weights is therefore adequately less. The same principle holds when calculating the score of each pillar or subindex.

Sample question

31. How do you perceive the quality of road infrastructure?

| roads are in poor condition and their capacity is significantly underestimated		1	2	3	4	5	6		road infrastructure is well developed and maintained		little	great
											importance	

1 I agree completely with the answer on the left–hand side
2 I largely agree with the answer on the left–hand side
3 I somewhat agree with the answer on the left–hand side than to the answer on the right–hand side
4 I somewhat agree with the answer on the right–hand side than to the answer on the left–hand side
5 I largely agree with the answer on the right–hand side
6 I agree completely with the answer on the right–hand side

Separation of survey and statistical parts of the RBEI
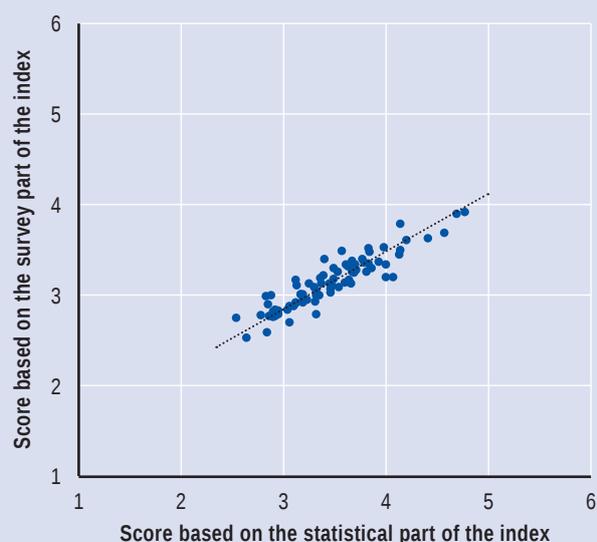
The Regional Business Environment Index consists of two types of indicators. While the indicators in the statistical component arise from measurable statistics kept by many Slovak institutions, the indicators in the survey part come from the *Survey of entrepreneurs' and municipality representatives' opinions* and are therefore based solely on enterpreneurs' perceptions.

There are two fundamental factors that ensure better representativeness of the index: that unbiased sample of respondents in each district answered the survey and that statistical and survey components of the index were compatible. Although each of these components examines the quality of business environment from a slightly different angle, they are closely related. If the respondents are dissatisfied with the business conditions, this should be reflected in lower competitiveness of their district, and hence in worse economic performance. This is confirmed by the correlation coefficient of 0.92 between the survey and the statistical component.

District	RBEI score			Number of respondents
	Total	From survey	From hard data	
Slovenská republika*	**3.43**	**3.19**	**3.55**	**5 015**
Bánovce nad Bebravou	3.24	3.00	3.35	43
Banská Bystrica	3.48	3.13	3.66	157
Banská Štiavnica	3.00	2.88	3.06	38
Bardejov	2.91	2.83	2.95	59
Bratislava I	4.42	3.90	4.69	170
Bratislava II	4.48	3.92	4.77	178
Bratislava III	4.14	3.63	4.41	129
Bratislava IV	4.27	3.69	4.57	89
Bratislava V	4.02	3.79	4.14	116
Brezno	3.13	3.01	3.19	54
Bytča	3.31	3.19	3.36	20
Čadca	3.05	2.91	3.12	63
Detva	3.11	2.94	3.19	51
Dolný Kubín	3.32	3.03	3.46	50
Dunajská Streda	3.54	3.49	3.57	68
Galanta	3.73	3.52	3.83	60
Gelnica	2.61	2.53	2.64	36
Hlohovec	3.78	3.34	4.00	40
Humenné	3.18	2.93	3.31	53
Ilava	3.64	3.40	3.77	59
Kežmarok	2.98	2.84	3.04	49
Komárno	3.14	2.95	3.23	73
Košice – okolie	3.15	2.79	3.32	53
Košice I	3.73	3.20	4.00	100
Košice II	3.77	3.20	4.07	65
Košice III	3.45	3.15	3.64	33
Košice IV	3.62	3.26	3.81	65
Krupina	3.05	2.92	3.12	32
Kysucké Nové Mesto	3.43	3.30	3.49	34
Levice	3.21	3.13	3.25	63
Levoča	2.94	2.70	3.06	31
Liptovský Mikuláš	3.52	3.34	3.61	75
Lučenec	3.03	2.88	3.10	62
Malacky	3.84	3.53	3.98	50
Martin	3.35	3.12	3.47	93
Medzilaborce	2.90	3.00	2.88	21
Michalovce	3.21	3.00	3.32	64
Myjava	3.33	3.22	3.39	45
Námestovo	3.12	3.11	3.13	45

District	RBEI score			Number of respondents
	Total	From survey	From hard data	
Nitra	3.54	3.25	3.69	96
Nové Mesto nad Váhom	3.72	3.48	3.84	65
Nové Zámky	3.23	3.09	3.30	79
Partizánske	3.12	3.01	3.17	32
Pezinok	3.58	3.34	3.70	65
Piešťany	3.68	3.30	3.86	74
Poltár	2.61	2.75	2.54	25
Poprad	3.67	3.35	3.83	86
Považská Bystrica	3.53	3.26	3.67	57
Prešov	3.39	3.09	3.54	93
Prievidza	3.34	3.13	3.45	104
Púchov	3.58	3.38	3.67	42
Revúca	2.83	2.77	2.86	47
Rimavská Sobota	2.78	2.78	2.78	58
Rožňava	3.09	2.92	3.19	62
Ružomberok	3.56	3.28	3.71	55
Sabinov	2.90	2.84	2.92	38
Senec	3.92	3.50	4.14	61
Senica	3.48	3.17	3.64	45
Skalica	3.64	3.36	3.79	48
Snina	2.85	2.76	2.90	46
Sobrance	2.90	2.99	2.83	44
Spišská Nová Ves	3.23	3.05	3.32	78
Stará Ľubovňa	3.12	3.01	3.17	57
Stropkov	2.86	2.90	2.85	36
Svidník	2.86	2.82	2.90	41
Šaľa	3.53	3.32	3.63	51
Topoľčany	3.29	3.13	3.37	50
Trebišov	2.87	2.77	2.92	69
Trenčín	3.75	3.37	3.93	83
Trnava	4.00	3.61	4.20	109
Turčianske Teplice	3.14	3.17	3.12	30
Tvrdošín	3.33	3.07	3.46	46
Veľký Krtíš	2.75	2.59	2.84	47
Vranov nad Topľou	2.89	2.79	2.95	59
Zlaté Moravce	3.39	3.18	3.49	40
Zvolen	3.45	3.14	3.60	74
Žarnovica	3.40	3.40	3.40	42
Žiar nad Hronom	3.44	3.26	3.53	59
Žilina	3.90	3.45	4.13	136

* The score for the Slovak Republic is a weighted average score of all districts, where weights are given as the population of districts as at December 31, 2009.

Structure and weights of the RBEI components

Subindex I: Economic activity 31%
  1st pillar: Economic environment 14%
  2nd pilar: Economic output...................................... 17%

Subindex II: Public administration and legislation... 15%
  3rd pillar: Legislation.. 7%
  4th pillar: Public administration 8%

Subindex III: Technology and infrastructure............. 23%
  5th pillar: Infrastructure.. 12%
  6th pillar: Technology...11%

Subindex IV: Education and human resources......... 31%
  7th pillar: Human resources 20%
  8th pillar: Education...11%

In the above text we have discussed the principles of calculating scores for all districts, whether in individual indicators or in larger units such as pillars, subindexes or finally throughout the whole RBEI. It should be noted that scores can be calculated not only for the districts, but also for the entire Slovak Republic. The (average) score of any indicator for the whole country is calculated as a weighted average score of all districts, where the weights correspond to the district population. Similarly, it is possible to evaluate a national average of pillars, subindexes, or the whole RBEI.

Overview of the indicators

For a better overview, we present a list of all 106 indicators entering the calculation of RBEI. The indicators are ordered by their classification in RBEI, where we chose the identification number of indicator consisting of the respective pillar number and the serial number of indicator within the pillar as the decisive criterion for their rank. The next element of indicator identification is its name. If the name is followed by an asterisk, the indicator comes from the survey. Otherwise, the indicator is based on statistical data.

All statistical indicators have three basic parameters below their name that reveal some important properties. The number listed on the left–hand side represents the weight of the indicator in RBEI. If the symbol in the middle part is '+', then higher values of the statistical data are beneficial for the district's business conditions. Conversely, the presence of the symbol '–' indicates that business conditions improve with the decrease of the original data, or that higher values are unwanted. This can be seen, for example, in unemployment rate. In such cases, however, the transformation used ensures that districts with low unemployment rates are finally rewarded with higher scores and vice versa.

The right–hand side of the parameter line contains information on the units of the original statistical data. Considering the use of both currencies 'Sk' and '€', we remind that figures before 2009 are reported in Slovak koruna and figures since 2009 in Euro. Indicators measuring property and motor vehicles tax represent their annual value. If the source data do not have a clearly identifiable unit, the term 'no unit' is used. The subsequent lines contain complete indicator identification. Composite indicators were created by aggregation of several sets of statistical data, where these sets were first transformed by the methods already explained and only then aggregated using appropriate weights. The last element of the indicator description informs the reader about the source of the statistical data, including the period covered by the statistics.

Description of the survey indicators has a different form. The line under the name of the indicator contains only two data. While the number on the left–hand side represents the indicator weight within RBEI, the word 'survey' on the right–hand side indicates that the indicator is affective, based on the survey, and thus is only a verbal complement to the asterisk placed right after the indicator name. Placing the symbols '+' or '–' known from the description of statistical indicators would be redundant, since the survey questions were constructed so that a higher average response represents better business conditions in the district. The next section of the indicator description presents the full wording of a survey question accompanied by the verbal meaning

of extreme responses and a histogram thumbnail. This histogram consists of six columns that, from left to right, represent relative frequency of each possible answer from the range {1, 2, 3, 4, 5, 6}. To improve the histogram clarity, a grid with a horizontal resolution of 10 % is included. Thus, for example, if the height of the third column from the left reaches the fourth grid line, which also surrounds the top of the histogram, approximately 40 % of all respondents chose answer {3}. Please note that the survey data were collected mainly in November 2009.

The model was developed and built on the most accurate data available at that time; some of the figures may have changed after the publication was completed. The results of the model based on the most recent data can be found on the project website.

1st pillar: Economic environment

1.01 Population density

20 | + | inhabitants / km²

Proportion of the population of the district to its size.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

1.02 Urbanization

12 | + | %

The share of population in cities in the total population of the district.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

1.03 Impact of district location on doing business*

12 | survey

How does your district location (availability of motorways, railways, proximity to customers, relationship to neighboring districts ...) affect business opportunities?
1 – its position is a crucial competitive disadvantage
6 – its strategic location allows for greater success in the market
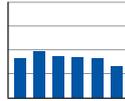
1.04 Impact of natural conditions on doing business*

4 | survey

How do the natural conditions in your region (climate, floods, terrain, ...) affect business opportunities?
1 – significantly increase business costs
6 – they are no obstacle
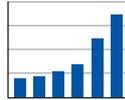
1.05 Area of agricultural land

5 | + | %

The share of agricultural land in a total area of the district.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

1.06 Current business conditions*

10 | survey

Assess your overall satisfaction with the current business conditions in your district
1 – maximum dissatisfaction
6 – maximum satisfaction
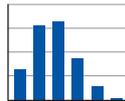
1.07 Change of business conditions in recent years*

4 | survey

Assess your overall satisfaction with the changes in business conditions in your district over the last three years
1 – maximum dissatisfaction
6 – maximum satisfaction
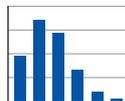
1.08 Barriers to improving business conditions*

8 | survey

Do you perceive any barriers to improving business conditions in your district?
1 – I see obstacles in many areas
6 – conditions in the region fully support the development of business environment
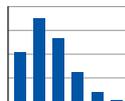
1.09 Impact of the minimum wage on doing business*

3 | survey

Does the level of minimum wage harm the business in your district?
1 – significantly impedes the employment of low skilled workforce
6 – its level is not a barrier to business
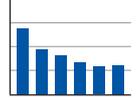
1.10 Impact of the informal economy on doing business*

8 | survey

To what extent does the informal economy (undocumented transactions) harm the business in your district?
1 – very adversely affects market conditions
6 – informal economy does not exist in the district
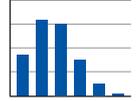
1.11 Level of competitiveness in services*

10 | survey

How well is competitiveness in services developed in your district?
1 – the district suffers from a significant lack of competition
6 – competition is very well developed
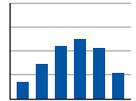
1.12 Level of competitiveness in industry*

8 | survey

How well is competitiveness in industry developed in your district?
1 – the district suffers from a significant lack of competition
6 – competition is very well developed
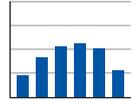
1.13 Reliability of business partners*

11 | survey

Do you consider your business partners in your district reliable and trustworthy?
1 – they often do not adhere to the agreed conditions
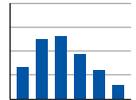6 – I can totally rely on them
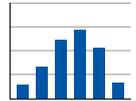
1.14 Availability of financial and capital resources*

8 | survey

How accessible are financial and capital resources in your district?
1 – the costs of obtaining necessary resources are intolerable
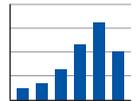6 – we can secure the necessary resources very effectively

1.15 Availability of necessary materials and services*

7 | survey

How difficult is it for your company to secure the materials and services necessary for its operation?
1 – their acquisition is very demanding and requires a long time
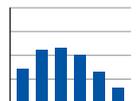6 – we can secure them very effectively

1.16 Development potential of the district*

8 | survey

How do you perceive the development potential of your district?
1 – will be the slowest developing district in the Slovak Republic
6 – will be the fastest developing district in the Slovak Republic

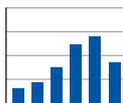* Data based on the *Survey of entrepreneurs' and municipality representatives' opinions.*

1.17 Potential for tourism development*

6 | survey

What is the potential for tourism development in
your district?
1 – the district does not have conditions for
attracting visitors
6 – favorable conditions in the region allow
significant development of services in tourism

1.18 Economically active population

10 | + | %

The share of economically active population in the total
population of the district, where economically active people are
defined as persons aged 15 years or more who work in the civil
sector, are unemployed or are members of the armed forces.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

1.19 Social benefit claims

8 | − | EUR

Average funds monthly drawn on social benefits per capita.

Source: Central Office of Labor, Social Affairs and Family of the SR | Nov. 2009

1.20 Share of foreign companies

5 | + | %

The share of foreign private enterprises in the total number of
enterprises in the district, where foreign companies are defined
as subjects founded and controlled by a foreign legal entity or a
natural person – entrepreneur.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

1.21 Share of international companies

5 | + | %

The share of international private enterprises in the total number
of enterprises in the district, where international companies are
defined as subjects founded jointly by an inland and foreign legal
person or a natural person – entrepreneur.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

2nd pillar: Economic output

2.01 Construcion output

48 | + | Sk

The volume of construction production done by own employees
in domestic enterprises based on the construction site per capita
– weighted average for the years 2006, 2007 and 2008, with
weights 12, 16 and 20, respectively.

Source: Yearbook of construction in the SR 2009, Statistical Office of the SR |
2006 – 2008; Database of Regional Statistics, Statistical Office of the SR | 2006
– 2008

2.02 Construction of apartments

12 | + | no unit

Composite indicator. The first component with a weight of
6 represents a transformed number of apartments under
construction in the district per capita as at December 31, 2008.
The second component, also with a weight of 6, represents
a transformed weighted sum of the number of completed
apartments in the district per capita in the years 2006, 2007 and
2008, with weights of 0.75, 1 and 1.25, respectively.

Source: Database of Regional Statistics, Statistical Office of the SR | 2006 – 2008

2.03 Produced added value

30 | + | Sk

The average added value produced by one employee working in
the district.

Source: Yearbook of industry in the SR 2009, Statistical Office of the SR | 2008

2.04 Employee productivity

45 | + | Sk

Composite indicator. The first component with a weight of
15 represents transformed average employee productivity in
the district. The second component, also with a weight of
15, represents transformed average volume of production per
employee. The third component with a weight of 15 represents
transformed turnover per employee.

Source: Yearbook of industry in the SR 2009, Statistical Office of the SR | 2008

2.05 Level of industry development

4 | + | %

The share of the average recalculated registered number of
employees in industry in the total economically active population
of the district.

Source: Yearbook of industry in the SR 2009, Statistical Office of the SR | 2008

2.06 Environmental friendliness of production

15 | − | kg / Sk

Composite indicator. The first component with a weight of 6
represents transformed volume of particulate emissions produced
in the district per produced value equivalent to 1 Sk. The next
three components, each with a weight of 3, are transformed
volumes of carbon monoxide, nitrogen oxides and sulfur dioxide
emissions produced in the district per produced value equivalent
to 1 Sk.

Source: Database of Regional Statistics, Statistical Office of the SR | 2007,
Yearbook of industry in the SR 2009, Statistical Office of the SR | 2007

2.07 Air pollution

5 | − | kg / km²

Composite indicator. The first component with a weight of
2 represents transformed volume of particulate emissions
produced in the district per 1 km² of district area. The next three
components, each with a weight of 1, represent transformed
volumes of carbon monoxide, nitrogen oxides and sulfur dioxide
emissions produced in the district per 1 km² of district area.

Source: Database of Regional Statistics, Statistical Office of the SR | 2007

2.08 Tourism activity

15 | + | no unit

Number of overnight visitors in accommodation facilities in the
district per capita.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

2.09 Tourism attractiveness

15 | + | no unit

Proportion of overnight visitors in accommodation facilities in the
district to district area.

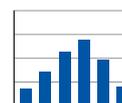Source: Database of Regional Statistics, Statistical Office of the SR | 2008

2.10 Profitability and productivity of businesses*

8 | survey

How do you perceive the prevailing profitability
and productivity of your enterprise?
1 – our revenues are insufficient even to cover
the necessary costs
6 – our management enables the company to
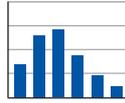significantly expand

2.11 Level of corruption among private businesses*

6 | survey

To what extent, in your estimation, does corruption among private enterprises occur in your district?
1 – its presence significantly deforms market conditions
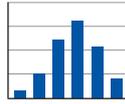6 – corruption among private enterprises is not present in the district

2.12 Development potential of businesses*

6 | survey

How do you perceive the development potential of your business?
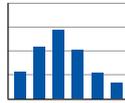1 – I assume its bankruptcy
6 – I assume its distinctive development

3rd pillar: Legislation

3.01 Barriers to business development*

6 | survey

Do you perceive any barriers to the development of your business?
1 – barriers do significantly and often unnecessarily limit its development
6 – development of our business is by no means restricted

3.02 Perception of local taxes*

4 | survey

How do you perceive the level of local taxes?
1 – local taxes are extremely high
6 – local taxes are negligible
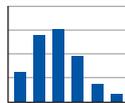
3.03 Business development prospects*

8 | survey

Will the current barriers to the development of your business be removed in the next two years?
1 – I expect substantial worsening of business conditions
6 – I am already noticing a significant improvement of business conditions
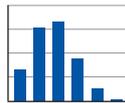
3.04 Non–construction land tax

5,25 | – | EUR / m²

Composite indicator. The first component with a weight of 1 represents transformed tax rate on arable land, hop gardens and vineyards. The second component, also with a weight of 1, represents transformed tax rate on permanent grassland. The third component, with a weight of 0.25, represents transformed tax rate on gardens. The fourth component, with a weight of 2, represents transformed tax rate on built–up areas and courtyards. The last component, with a weight of 1, represents transformed tax rate on other areas excluding building plot.

Source: Legally binding regulations of district centers | 2010

3.05 Building site tax

8 | – | EUR / m²

Tax rate on building site.

Source: Legally binding regulations of district centers | 2010

3.06 Housing tax and tax on ancillary facilities

2,25 | – | EUR / m²

Composite indicator. The first component with a weight of 1 represents transformed tax rate on buildings for housing and small buildings that have a function ancillary to that of the main building. The second component, with a weight of 0.25, represents transformed tax rate on recreational gardeners' cottages and houses for individual recreation. The third component, with a weight of 1, represents transformed tax rate on detached garage and separate garage buildings designed or used for these purposes, but built outside of residential buildings.

Source: Legally binding regulations of district centers | 2010

3.07 Agricultural and irrigation tax

2 | – | EUR / m²

Tax rate on buildings for agricultural production, greenhouses, structures for water management, buildings used for storage of own agricultural production, including buildings for own administration.

Source: Legally binding regulations of district centers | 2010

3.08 Industrial property tax

10 | – | EUR / m²

Composite indicator. The first component with a weight of 8 represents transformed tax rate on industrial buildings, power engineering buildings, construction, buildings used for storage of own productions, including buildings for own administration. The second component, with a weight of 2, represents transformed tax rate on other buildings.

Source: Legally binding regulations of district centers | 2010

3.09 Taxes on buildings for other business

10 | – | EUR / m²

Composite indicator. The first component, with a weight of 8, represents transformed tax rate on buildings for other business, storage and administration associated with business. The second component, with a weight of 2, represents transformed tax rate on other buildings.

Source: Legally binding regulations of district centers | 2010

3.10 Apartment and non–residential property tax

2,5 | – | EUR / m²

Composite indicator. The first component, with a weight of 0.25, represents transformed tax rate on flats. The second component, with a weight of 2, represents transformed tax rate on non–residential premises for business. The third component, with a weight of 0.25, represents transformed tax rate on business premises.

Source: Legally binding regulations of district centers | 2010

3.11 Motor vehicle tax

12 | – | EUR / m²

Composite indicator. The first component, with a weight of 4, represents transformed tax rate on passenger cars with engine capacity from 1500 ccm to 2000 ccm. The second component, also with a weight of 4, represents transformed tax rate on commercial 1– or 2– axle vehicles and buses from 2 tons to 4 tons. The third component, with a weight of 4, represents transformed tax rate on 3–axle commercial vehicles and buses from 19 tons to 21 tons.

Source: Legally binding regulations of self–governing regions | 2009

3.12 Charges for municipal waste

8 | – | EUR / l

Composite indicator. The first component, with a weight of 3, represents transformed fee for garbage collection from waste containers (dustbin) with a capacity of 110 liters. The second component, with a weight of 5, represents transformed fee for a garbage collection from waste containers with a capacity of 1100 liters.

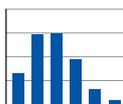Source: Legally binding regulations of district centers | 2009

4th pillar: Public administration

4.01 Fulfillment of tasks by local authorities*

10 | survey

Do the authorities perform their duties as expected by entrepreneurs?
1 – they perform their duties very poorly
6 – they perform duties beyond their obligations

4.02 Bureaucracy and delays in the offices*

10 | survey

Do you encounter bureaucracy and delays in the administrative proceeding with the authorities?
1 – everytime
6 – have not encountered yet
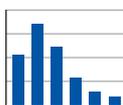
4.03 Availability of public information*

6 | survey

How do you perceive communication with the authorities and availability of public information (about the activities of the authorities, regulations, notices, ...)?
1 – I cannot obtain any information
6 – communication is prompt and information is easily available and comprehensible
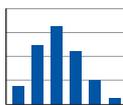
4.04 Electronic communication with local authoroties*

6 | survey

Are you satisfied with the level of electronic communication with the authorities?
1 – authorities do not support electronic communication
6 – they react objectively and expeditiously
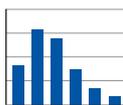
4.05 Law enforcement in the district court*

20 | survey

Are you satisfied with the law enforcement in your district court?
1 – judges resolve disputes very slowly and act unfairly
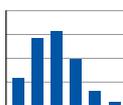6 – judges resolve disputes without delay and fairly
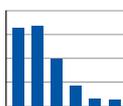
4.06 Impact of corruption on authorities' decisions*

12 | survey

In your estimation, how often are decisions made by the authorities affected by corruption?
1 – almost always
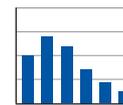6 – corruption does not occur in the offices

4.07 Protection of private property*

10 | survey

Is private property in your district protected sufficiently?
1 – state and police fail to protect property
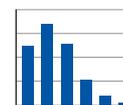6 – property rights are fully respected

4.08 Interest of the state institutions in the district*

6 | survey

To what extent is the state (government ministries, Parliament, other institutions) interested in your district?
1 – the situation in our district is indifferent to state
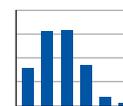6 – the state takes keen interest in solving problems in our district

4.09 Impact of authorities' activities on doing business*

9 | survey

To what extent do the authorities affect business environment?
1 – they create significant barriers
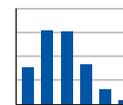6 – they significantly contribute to its development

4.10 Economic management of local self–governments*

8 | survey

Do the local authorities manage your district effectively?
1 – their ineffective management generates significant debt
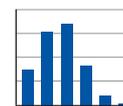6 – their management promotes the development of the region

4.11 Impact of trade unions on doing business*

2 | survey

What is the impact of trade unions on doing business in your district?
1 – their activity significantly harms the business environment
6 – their activity significantly contributes to improving business conditions

5th pillar: Infrastructure

5.01 Availability of banks

12 | + | no unit

Composite indicator. The first component, with a weight of 3, represents a transformed number of branches of commercial banks in the district per 1000 inhabitants. The second component, with a weight of 1, represents a transformed number of other organizational units of commercial banks in the district per 1000 inhabitants. The third component, with a weight of 6, represents a transformed number of branches of commercial banks in the district per 1 km² area of the district. The fourth component, with a weight of 2, represents a transformed number of other organizational units of commercial banks in the district per 1 km² area of the district.

Source: National Bank of Slovakia | Sep. 2009

5.02 Availability of post offices

8 | + | no unit

Composite indicator. The first component, with a weight of 2, represents a transformed number of post offices in the district per 1000 inhabitants. The second component, with a weight of 6, represents a transformed number of post offices in the district per 1 km² area of the district.

Source: Slovak Post Office | Dec. 2008

5.03 Capacity of medical facilities

4 | + | no unit

Number of beds in hospitals in the district per 1000 inhabitants.

Source: National Health Information Center | 2008

5.04 Quality of road infrastructure*

15 | survey

How do you perceive the quality of road infrastructure?
1 – roads are in poor condition and their capacity is significantly underestimated
6 – road infrastructure is well developed and maintained
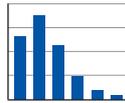
5.05 Density of motorways

35 | + | %

The share of the area of motorways and motorway feeders in the district in the total area of the district. This indicator is not defined for urban districts of Bratislava and Košice, for the purpose of our index, motorways and their feeders in the urban districts are categorized as 1st class roads.

Source: Slovak Road Administration | Dec. 2008

5.06 Density of 1st class roads

25 | + | %

The share of the area of 1st class roads in the total area of the district. In the case of urban districts of Bratislava and Košice, the area of motorways and their feeders multiplied by 1.4 is added to the area of 1st class roads.

Source: Slovak Road Administration | Dec. 2008

5.07 Density of 2nd class roads

15 | + | %

The share of the area of 2nd class roads in the total area of district.

Source: Slovak Road Administration | Dec. 2008

5.08 Density of 3rd class roads

5 | + | %

The share of the area of 3rd class roads in the total area of district.

Source: Slovak Road Administration | Dec. 2008

5.09 Utilization of roads

20 | – | %

Proportion of the number of passenger cars in the district to the weighted sum of the areas of highways and 1st, 2nd and 3rd class with weights of 7, 5, 3 and 1, respectively.

Source: Ministry of Interior of the Slovak Republic | Dec. 2008; Slovak road administration | Dec. 2008

6th pillar: Technology

6.01 Inflow of foreign direct investments

60 | + | no unit

Inflow of foreign direct investments into the district by the year 2008 per capita.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008
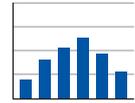
6.02 Technology level*

24 | survey

How do you perceive the level of technological sophistication in your district?
1 – our district is one of the least technologically advanced in Slovakia
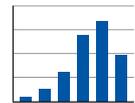6 – our district is one of the most technologically advanced in Slovakia

6.03 Ability of businesses to use latest technologies*

6 | survey

Is your company able to use the latest technologies?
1 – latest technologies are of no benefit to our business
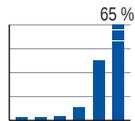6 – our services/products are based on them

6.04 Usage of Internet services by businesses*

10 | survey

To what extent does your company use internet services?
1 – our company has no website or e–mail
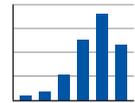6 – Internet and electronic communication are essential to our business

65 %

6.05 Information on the supply of goods and services*

3 | survey

Do you have enough information on goods and services available in your district?
1 – it is extremely difficult to obtain information
6 – information can be obtained very easily

6.06 Usage of personal motor vehicles

10 | + | no unit

Number of vehicles registered in the district used primarily for passenger car traffic per capita.

Source: Ministry of Interior of the Slovak Republic | Dec. 2009

6.07 Usage of trucks

10 | + | no unit

Number of vehicles registered in the district used primarily for cargo transport per 1 Sk of produced value.

Source: Ministry of Interior of the Slovak Republic | Dec. 2009

6.08 Usage of technical motor vehicles

4 | + | no unit

Number of technical motor vehicles registered in the district per 1 Sk of produced value.

Source: Yearbook of industry in the SR 2009, Statistical Office of the SR | 2009

7th pillar: Human resources

7.01 Life expectancy

8 | + | year

Composite indicator. The first component, with a weight of 4, represents transformed life expectancy at birth of men. The second component, also with a weight of 4, represents transformed life expectancy at birth of women.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

7.02 Natural population growth

4 | + | no unit

Difference between the number of live births and deaths of persons per 1000 inhabitants of the district.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

7.03 Ageing index

10 | – | no unit

Number of persons in productive age per 100 persons in pre–productive age. Methodology of the Statistical Office defines persons in the post–productive age as men aged 60 and over and women aged 55 and over.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

7.04 Registered unemployment rate

50 | – | %

The registered unemployment rate calculated according to the methodology of the Ministry of Labour, Social Affairs and Family as a proportion of available jobseekers to the total economically active population of the district.

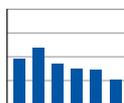Source: Central Office of Labor, Social Affairs and Family of the SR | Dec. 2009

7.05 Perception of unemployment*

8 | survey

How would you describe unemployment in your district?
1 – I find it alarming
6 – anyone who wants to work has already got the job

7.06 Share of long–term jobseekers

20 | – | index

The share of long–term jobseekers is evaluated on the basis of the index of a period of time a jobseeker needs to find work. This index is a function of the length of the period of unemployment of all jobseekers and is calculated from the number of people in 11 different groups according to the length of the registered period as follows: 1) based on twelve monthly data from 2009, the average number of applicants throughout the year for each group was calculated; 2) dividing the number of applicants in each group by the total population of district gives us the share of apllicants in all groups; 3) average share of applicants is calculated (arithmetic mean of 11 numbers); 4) dividing the shares in 11 groups by the above–mentioned average creates 11 coefficients, which compare the average number of applicants in each group; 5) the resulting index is defined as a weighted average of these coefficients, where the weight of each coefficient is equal to the square root of the center of appropriate interval, considering the center of the last interval to be 72 months. Note: if all groups contain the same number of jobseekers, the index equals 1. The less the index value, the shorter period of time the applicant seeks his job. Conversely, an index greater than 1 indicates the predominance of long–term unemployed jobseekers.

Source: Central Office of Labor, Social Affairs and Family of the SR | Jan. 2009 – Dec. 2009

7.07 Age structure of jobseekers

8 | – | index

Age structure of jobseekers is evaluated on the basis of similarly named index. This index is a function of the age of all jobseekers in the district and is calculated from the number of applicants in 10 different age groups, each containing a five–year interval, as follows: 1) based on nine monthly data of Jan. 2009 – Sep. 2009, the average number of applicants throughout the period for each group was calculated; 2) dividing the number of applicants in each group by the total population of district gives us the share of applicants in all groups; 3) the average share of applicants is calculated (arithmetic mean of 10 numbers); 4) dividing the shares in 10 groups by the above–mentioned average creates 10 coefficients, which compare the average number of applicants in each age group; 5) the resulting index is defined as a weighted average of these coefficients, where the weight of each coefficient is gradually (from the youngest to the oldest) {3.5; 1; 1.5; 2; 2.5; 3; 3.5; 4; 4.5}. Note: if all groups contain the same number of jobseekers, the index equals 1. The less the index value, the younger the average jobseeker. Conversely, the index greater than 1 indicates a predominance of older jobseekers.

Source: Central Office of Labor, Social Affairs and Family of the SR | Jan. 2009 – Sep. 2009
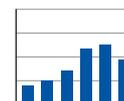
7.08 Availability of free labor*

4 | survey

Is there long–term availability of employable workforce in your district?
1 – we are forced to look for free workforce outside our district
6 – number of people applying for jobs far exceeds the demand

7.09 Labor market dynamics

10 | + | no unit

For each month in 2009, the sum of inflow and outflow of jobseekers in the district was calculated. This sum was then divided by the total number of jobseekers in the district at that time. Averaging this twelve monthly data gives us the average rate of labor market dynamics throughout 2009.

Source: Central Office of Labor, Social Affairs and Family of the SR | Jan. 2009 – Dec. 2009

7.10 Job vacancies in services

2 | – | no unit

Vacancies for each class of ISCO job classification, categories 1 to 5 – services and administration.

Source: Central Office of Labor, Social Affairs and Family of the SR | Dec. 2009

7.11 Job vacancies in industry

4 | – | no unit

Vacancies for each class of ISCO job classification, categories 6 to 8 – industry.

Source: Central Office of Labor, Social Affairs and Family of the SR | Dec. 2009

7.12 Unskilled job vacancies
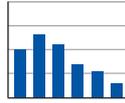
6 | – | no unit

Vacancies for each class of ISCO job classification, category 9 – unskilled jobs.

Source: Central Office of Labor, Social Affairs and Family of the SR | Dec. 2009

7.13 Migration of skilled labor*

6 | survey

How do you perceive the movement of skilled labor from and to your district?
1 – district suffers from a significant outflow of skilled workers
6 – availability of attractive job vacancies motivates skilled workers to arrive

7.14 Net migration

10 | + | no unit

The difference between the number of immigrants and emigrants per 1000 inhabitants of the district.

Source: Database of Regional Statistics, Statistical Office of the SR | 2008

7.15 Average monthly wage

50 | + | Sk

The average monthly wage in industry (natural persons).

Source: Yearbook of industry in the SR 2009, Statistical Office of the SR | 2008

7.16 Wage expectations of jobseekers*

4 | survey

Do the jobseekers in your company have adequate expectations about their monthly wage?
1 – wage expectations are much higher than is the real benefit from employee
6 – wage expectations are significantly lower than offered by the labor market conditions
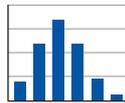
7.17 Discipline and diligence of employees*

8 | survey

How are you satisfied with the discipline and diligence of your employees?
1 – poor employee discipline significantly reduces the productivity of our business
6 – employees are willing to contribute to the enhancement of the company's performance
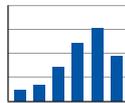
7.18 Duration of sick leave

16 | – | %

Proportion of the number of calendar days of sick leave due to illness or injury to the number of days covered by sickness insurance.
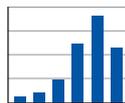
Source: Database of Regional Statistics, Statistical Office of the SR | 2008

7.19 Employee motivation for productivity increase*

4 | survey

Are employees in your company motivated to increase their labor productivity (e.g. by a remuneration system)?
1 – employee motivation is very low
6 – motivation system is one of the main sources of our business development

7.20 Fairness in employee selection*

10 | survey

How are employees in your district selected for their jobs (both management and regular)?
1 – positions are filled by close friends or family members irrespective of their quality
6 – employees are selected solely on the basis of best qualification
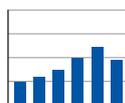
8th pillar: Education

8.01 Level of education*

18 | survey

How do you perceive the level of education of people in your district?
1 – as the lowest among all districts in Slovakia
6 – as the highest among all districts in Slovakia
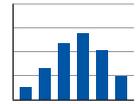
8.02 Knowledge of foreign languages*

12 | survey

What is the level of foreign language skills of people in your district?
1 – their poor knowledge of foreign languages significantly complicates business and discourages investors
6 – their good knowledge of foreign languages greatly increases work efficiency
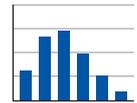
8.03 School leaving examination results – Slovak language

16 | + | no unit

Composite indicator. The first component, with a weight of 8, represents a transformed average success rate of students from gymnasiums taking examination in written Slovak language. The second component, also with a weight of 8, represents a transformed average success rate of students from secondary vocational schools taking examinations in written Slovak language.

Source: National Institute for Certified Educational Measurements | May 2009

8.04 School leaving examination results – Mathematics

16 | + | no unit

Composite indicator. The first component, with a weight of 8, represents a transformed average success rate of students from gymnasiums taking examinations in the mathematics. The second component, also with a weight of 8, represents a transformed average success rate of students from secondary vocational schools taking examinations in the mathematics.

Source: National Institute for Certified Educational Measurements | May 2009

8.05 Number of secondary school students

8 | + | %

Composite indicator. The first component, with a weight of 4, represents a transformed share of gymnasium students in the general population. The second component, also with a weight of 4, represents a transformed share of secondary vocational school students in the general population.

Source: Institute of Information and Prognosis in Education | Sep. 2008

8.06 Scores achieved in Monitor 9 test – Slovak language

8 | + | no unit

The average percentage of primary school pupils in Monitor 9 – score achieved in the test of the Slovak language.

Source: National Institute for Certified Educational Measurements | May 2009

8.07 Scores achieved in Monitor 9 test – Mathematics

8 | + | no unit

The average percentage of primary school pupils in Monitor 9 – score achieved in the test of mathematics.

Source: National Institute for Certified Educational Measurements | May 2009

8.08 Number of primary school pupils

4 | + | %

The share of primary school pupils in the general population.

Source: Institute of Information and Prognosis in Education | Sep. 2008
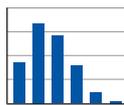
8.09 Connection of vocational schools and labor market*

12 | survey

How do you perceive the interconnection between vocational schools in your district and the labor market?
1 – schools produce graduates with low chances of employment
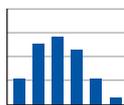6 – the training fully corresponds with the practical needs

8.10 Qualification of jobseekers*

12 | survey

How do you perceive the qualifications of jobseekers in your district?
1 – candidates need additional training to increase their chances in job market
6 – qualification of applicants fully meets the needs of the market

8.11 Availability of highly skilled labor

8 | – | %

Composite indicator. The first component, with a weight of 5, represents a transformed share of unemployed with university degree in the total economically active population in the district. The second component, with a weight of 3, represents a transformed proportion of unemployed graduates with university degree to the total economically active population in the district.

Source: Central Office of Labor, Social Affairs and Family of the SR | Sep. 2009

8.12 Availability of skilled labor

10 | – | %

Composite indicator. The first component, with a weight of 4, represents a transformed share of unemployed with upper secondary education in the total economically active population of the district. The second component, with a weight of 3, represents a transformed proportion of unemployed with vocational education to the total economically active population of the district. The third component, with a weight of 2, represents a transformed share of unemployed school leavers with upper secondary education in the total economically active population of the district. The last component, with a weight of 1, represents a transformed share of unemployed graduates with vocational education in the total economically active population of the district.

Source: Central Office of Labor, Social Affairs and Family of the SR | Sep. 2009

8.13 Availability of unskilled labor

2 | – | %

The share of unemployed with primary education or no education in the total economically active population.

Source: Central Office of Labor, Social Affairs and Family of the SR | Sep. 2009