Assessment of conditions for enterprising in selected regions using the Regional Economic Development Risk indicator

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Abstract: Diversity of regions is monitored not only within the respective country, but also by business managers in evaluating their business opportunities in the respective region. In such cases, the managers' decisions are based on the information if the conditions are suitable for economic operations of the respective company. This includes not only evaluation of the company's resources; also the analyses of the company's environment are of a great importance. There are many indicators whose values are measured by statistical offices at the regional and national levels; however, when assessing a region, it is necessary to consider the indicators in mutual relations. For the said reason, use of indicators designed as synthetic is available. The Regional Economic Development Risk indicator is such indicator, which includes not only the selected economic aspects, but also the social aspect and partially the environmental aspect. The said indicator can be used for evaluation of the region within a higher-level unit, including from the corporate viewpoint (if the region has any advantages for business development). The indicator is created by application of fuzzy logic, and in this article, two selected regions of the Czech Republic are evaluated with this indicator, namely Hradec Kralove and Pardubice regions.

Key words: Regional economic development risk, region's level, macro-economic indicators, fuzzy logic

1 Introduction

Assessing a region's level is based on economic, social and environmental aspects. It is also closely linked to strategic documents of individual countries, which is also true of the Czech Republic. Assessment indicators are defined in connection to the Czech Republic's Regional Development Strategy and are assigned to information sources [3].

Analyses of macro-economic indicators and consequences of the development have been the core of studies by a number of influential economists in different periods and countries (see e.g. [1], [5], [6]).

The macro-economic balance, characterised by the level of the gross domestic product, i.e. by a balance of the aggregate offer and aggregate demand, is constantly disturbed by destabilising influences [7]. Professional literature (e.g. [5], [11]) involves the following basic indicators: annual gross domestic product growth rate, annual inflation rate, annual inflation rate and the percentage of commercial balance (payment balance) against the nominal gross domestic product.

Although full use of all indicators is hardly feasible, it is possible to choose a certain compromise between a higher proportion of an objective and inferior results in another objective or objectives.

Assessing the differences between regions within a single country is important not only from the macro-economic perspective, but also in the light of entrepreneurial activities being implemented or intended in a region. Contrarily to big firms, small firms interact intensively with the territory in which they located, as a signal of their embeddedness. [2].

The aim of this paper is to assess a region's economic development and to predict whether the region will develop along the same lines as other regions, or whether it will be faced with a threat and in need of support.

In order to attain this goal, I use the Regional Economic Development Risk Indicator (the fundamental assumptions from which the concept stems are not detailed herein, see [8] for more information).

2 Problem Formulation

Regional Economic Development Risk Indicator

The synthetic Regional Economic Development Risk Indicator has been compiled using the generally valid criteria defined for the Czech Republic's micro-regions with state support, such as:

- the unemployment rate of the given micro-region is 25% or more higher than the indicator of the region (or the higher administration unit),
- the tax revenue indicator is 90% or less of the indicator of the region,
- the average salary in the micro-region is 95% or less of the indicator of the region,
- the indicator of the relative number of entrepreneurs in the micro-region is 95% or less of the indicator of the region,
- the indicator of the population density in the micro-region is 95% or less of the indicator of the region,
- the indicator of the natural increase of the population in the micro-region is negative.

The concept also respects some special criteria intended for structurally impaired and economically poor regions in need of focused support, namely:

- the indicator of employment in agriculture is 15% or more higher than the indicator of the region,
- the indicator of employment in industry is 8% or more higher than the indicator of the region.

The percentage values of the indicators in relation to the higher administration unit are not conceived as sharp values, for the use of fuzzy sets enables assessing the risk rate of partial criteria and the extent of their attainment in much greater detail.

The Regional Economic Development Risk indicator involves:

- gross domestic product per capita,
- the number of registered entrepreneurs per 1,000 persons,
- the portion of the population employed in agriculture,
- the portion of the population employed in industry,
- the natural increase of the population,
- the index of the population's financial security.

The index of the population's financial security F is defined as a ratio between the average salary in the region and the number of unemployed in the region (for more detail see [8]).

3 Problem Solution

3.1 Conception and evaluation of the Regional Economic Development Risk Indicator using fuzzy sets

Fuzzy logic is a sub-field of mathematics and is derived form the fuzzy set theory [9], where logical statements are assigned a relevance grade (on a scale), whose values are within the interval [0, 1]. [12]

In this way fuzzy logic differs from the classical statement and predicate logic, where statements are either true, i.e. are assigned a value of 1 in the binary system, or false, i.e. are assigned a value of 0. [10]

Next, we will describe the individual steps of the process of fuzzy processing of the case study for the Hradec Kralove Region; i.e. we will construct and assess the Regional Economic Development Risk Indicator.

Creating fuzzy logic systems can be broken down into the following steps:

1. Basic variable – depending on the nature of the system, we choose basic variable A, whose value is to be identified in the fuzzy process. In this case, the basic variable equals the Regional Economic Development Risk indicator *R.*

2. Basic variable attributes – this step defines *m* attributes (levels) of the basic variable. The case study contains the following attributes pertaining to risk *R:*

VHR (very high risk), HR (high risk), MR (moderate risk), LR (low risk), VLR (very low risk), ZR (zero risk),
i.e. $m = 6$. (1)

3. Partial variables – according to the nature of the system, we define *n* partial variables of the system, whose values influence the resulting value of the basic variable of the system. As we have said earlier, the Regional

Economic Development Risk indicator R involves the indicators of the gross domestic product per capita (GDPC), the number of registered entrepreneurs per 1,000 persons (NRE), the natural increase of population (NIP), the number of people employed in agriculture (NPEA), the number of people employed in industry (NPEI) and the standardised Population financial security index *F*. Table 2 shows these values for the Hradec Kralove Region and Table 3 for the Czech Republic.

Table 2 Values of choice indicators in the Hradec Kralove Region

Year	**GDPC** (CZK)	**NRE** (number of companies/1,000 citizens)	**NIP**(number of citizens)	**NPEA** (%)	**NPEI** (%)	F_{norm} **(-)**
1996	159,612.17	14.43	-964	6.53	44.66	0.389
1997	174,512.62	16.83	-1045	6.41	43.54	0.248
1998	188,008.58	17.84	-858	5.62	43.33	0.138
1999	195,872.37	18.96	-991	7.42	42.77	0.102
2000	209,862.99	19.68	-830	7.44	40.28	0.188
2001	222,603.21	20.29	-851	5.39	43.56	0.195
2002	227,868.93	21.20	-767	5.59	43.20	0.153
2003	234,508.37	22.16	-921	5.50	38.31	0.149
2004	254,720.71	22.35	-557	6.08	39.47	0.163
2005	264,873.20	22.61	-303	4.89	43.16	0.187
2006	276,868.41	22.82	-200	3.92	41.70	0.257
2007	301,849.48	23.10	536	4.07	43.33	0.428
2008	313,532.28	23.54	728	3.89	45.65	0.471
2009	309,570.08	23.34	350	4.03	41.92	0.251

Source: [4]

Table 3 Values of indicators under consideration within the Czech Republic

Year	**GDPO** (CZK)	**NRE** (number of companies/ 1,000 citizens)	**NIP** (number of citizens)	**NPEA (%)**	**NPEI (%)**
1996	163,183.00	14.25	-22,336	4.97	25.88
1997	175,772.00	15.80	-22,087	4.70	26.52
1998	193,929.00	17.31	-18,992	4.25	27.58
1999	202,357.00	19.10	-20,297	3.97	28.86
2000	213,110.00	19.98	-18,091	3.72	29.83
2001	230,064.00	20.79	-17,040	3.64	30.98
2002	241,593.00	21.79	-15,457	3.65	30.71
2003	252,617.00	22.78	-17,603	3.51	29.68
2004	275,770.00	23.02	-9,513	3.27	29.50
2005	291,560.00	23.30	-5,727	3.21	29.53
2006	313,868.00	23.63	1,390	3.09	30.54
2007	342,494.00	23.91	9,996	2.89	30.68
2008	353,701.00	24.38	14,622	2.82	30.91
2009	345,601.00	24.47	10,927	3.12	28.50
2010	348,928.00	25.04	10,309	3.10	28.47
2011	349,051.00	25.14	4,890	2.94	29.34

Source: [4]

The GDPC, NRE, NIP, NPEA and NPEI help define partial variables *H*, R_P, P_o, P_Z, P_P (respectively) expressing the difference of the percentage of the national and corresponding regional indicator.

Given the fact that a growth in the values of the GDPC, NRE, NIP, NPEA and NPEI causes a growth of the value *R*, while an increase of the standardised.

Financial security of the population index *F* makes *R* go down, we have, for the purpose of the fuzzy processing, introduced the *Index of the population's financial insecurity G*, determined as

$$G = (1 - F) \cdot 100 \ (\%) \qquad (2)$$

Particular values of the partial variables (n = 6) in the Hradec Kralove Region for 1996 to 2011 are listed in Table 4.

Table 4 Values of partial variables

Year	H (%)	R_P (%)	P_o (%)	P_Z (%)	P_P (%)	G (%)
1996	2.19	-1.29	-4.25	1.56	-18.8	61.06
1997	0.72	-6.47	-2.54	1.71	-17.0	75.19
1998	3.05	-3.07	-2.93	1.36	-15.8	86.18
1999	3.20	0.74	-1.78	3.45	-13.9	89.76
2000	1.52	1.49	-2.55	3.72	-10.5	81.24
2001	3.24	2.40	-1.20	1.75	-12.6	80.48
2002	5.68	2.73	-1.16	1.93	-12.5	84.73
2003	7.17	2.72	-0.42	1.99	-8.63	85.13
2004	7.63	2.91	0.87	2.81	-9.96	83.67
2005	9.15	2.96	-0.06	1.68	-13.6	81.35
2006	11.79	3.41	4.99	0.83	-11.2	74.30
2007	11.87	3.37	-0.08	1.19	-12.7	57.19
2008	11.36	3.44	0.84	1.08	-14.7	52.93
2009	10.43	4.60	4.09	0.91	-13.4	74.85
2010	11.46	4.68	1.35	0.37	-12.8	75.91
2011	19.05	3.66	6.40	0.52	-9.30	65.82

Source: Own

Positive percentage values express a decrease in comparison with the national average; negative values express an increase in comparison with the national average.

4. Attributes of partial variables – the attributes of the partial variables correspond to attributes (1) of the basic variable of the system.

5. Partial variable transformation matrix T – the partial variable transformation matrix is a matrix with m lines and n columns, whose elements $t_{i,j}$, i = 1, 2,…, m, j = 1, 2,…, n, are numbers corresponding to the limits of the intervals of the attributes of the partial variables pertaining to the issue in question. These interval limits must be determined on the grounds of experience gained by the experts in the given field, as we did in the case study presented. Table 5 contains an overview of the particular attribute interval limits (1) of the partial variables of the system. The transformation matrix **T** (grey background) is a mathematical representation of these limits.

Table 5 Interval limits of partial system variables´attributes

	H (%)	R_P (%)	P_o (%)	P_Z (%)	P_P (%)	G (%)
VHR	20	15	5	3	7	50
HR	15	10	4	2	4	40
MR	10	6	3	1	2	30
LR	8	4	2	0.5	1	20
VLR	5	2	1	0.2	0.5	10
ZR	0	0	0	0	0	0

Source: own

6. Partial variable status matrix – the partial variable status matrix is a matrix with m lines and n columns, and is a mathematical representation of the actual status of the system as it is described by the partial variables.

Elements $s_{i,j}$, i = 1, 2,…, m, j = 1, 2,…, n, of matrix S represent truth values 0 (the particular value of the partial variable lies beyond the interval subjected to the test) or 1 (the particular value lies within the interval subjected to the test). The testing itself takes place in the following manner (this is an example applying to variable H and the limit values from Table 5):

If $H \geq 20$, variable H is in the state of very high risk VHR,
If $20 > H \geq 15$, variable H is in the state of high risk HR,
If $15 > H \geq 10$, variable H is in the state of moderate risk MR,
If $10 > H \geq 8$, variable H is in the state of low risk LR,
If $8 > H \geq 5$, variable H is in the state of very low risk VLR,
If $5 > H$, variable H is in the state of zero risk ZR.

Regarding 2011, in particular, we obtain the following partial variable states:
H…HR, R_P…VLR, P_o…VHR, P_Z…LR, P_P…ZR, G…VHR,
as is presented in Table 6, containing state matrix **S** (grey background) as a mathematical representation.

Table 6 Truth values of partial system variables for 2011

	H	R_P	P_o	P_Z	P_P	G
VHR	0	0	1	0	0	1
HR	1	0	0	0	0	0
MR	0	0	0	0	0	0
LR	0	0	0	1	0	0
VLR	0	1	0	0	0	0
ZR	0	0	0	0	1	0

7. Basic variable value – is a numerical value of basic variable *A*, equal to the dot product of the transformation and status matrix.

$$A = \mathbf{T} \cdot \mathbf{S} = \sum_{i=1}^{m} \sum_{j=1}^{n} t_{i,j} s_{i,j} \qquad (3)$$

In this case, the value of the 2011 Regional Economic Development Risk indicator R_{11} equals 72.5.

$$R_{11} = \begin{pmatrix} 20 & 15 & 5 & 3 & 7 & 50 \\ 15 & 10 & 4 & 2 & 4 & 40 \\ 10 & 6 & 3 & 1 & 2 & 30 \\ 8 & 4 & 2 & 0.5 & 1 & 20 \\ 5 & 2 & 1 & 0.2 & 0.5 & 10 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix} \cdot \begin{pmatrix} 0 & 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix} \qquad (4)$$

8. Limits of basic variable attribute intervals – the determination of the limits of the intervals of the basic variable attributes is fully in the competence of the expert in the given field. The maximum value of the basic variable, defined as the total of the maximum values in each of the columns in the transformation matrix **T**, determines the upper limit.

$$A_{\max} = \sum_{j=1}^{n} \max\left(t_{i,j}\right)_{i=1}^{m} \qquad (5)$$

In the case study $R_{max} = 100$. The limits of the attribute intervals pertaining to the Regional Economic Development Risk *R*, selected in the case study, are listed in Table 7.

Table 7 Interval limits of basic variable attributes

	R		***R***
VHR	95	**LR**	40
HR	80	**VLR**	20
MR	60	**ZR**	0

9. Retransforming the basic variable – a process which assigns the calculated numerical value the corresponding attribute of the basic variable on the grounds of the retransformation table, i.e. Table 8.

The retransformation conditions use the attribute interval limits of the variable from Table 7.

Table 8 Retransformation table of basic variable

VHR	**HR**	**MR**
$100 > R \geq 95$	$95 > R \geq 80$	$80 > R \geq 60$
LR	**VLR**	**ZR**
$60 > R \geq 40$	$40 > R \geq 20$	$20 > R \geq 0$

If we assign the attribute to value $R_{11} = 72.5$, it is obvious that in 2011 the region in question was in the moderate risk state.

10. Trend of the Regional Economic Development Risk indicator – for the purpose of prediction or a more detailed evaluation of the Regional Economic Development Risk Indicator *R*, it is suitable to evaluate its value for a longer period of time and apply the regression function to the values acquired.

In the period in question, the values of the Regional Economic Development Risk indicator can be described using attributes ranging from low to moderate risk (Table 9, Fig. 1).

Table 9 Risk of Regional Economics Development – Hradec Kralove Region

Year	**Value of indicator**	**Attribute**
1999	53	LR
2000	53	LR
2001	53	LR
2002	58	LR
2003	58	LR
2004	59	LR
2005	61	MR
2006	66.5	MR
2007	63	MR
2008	63	MR
2009	68,5	MR
2010	65,2	MR
2011	72.5	MR

Source: Own

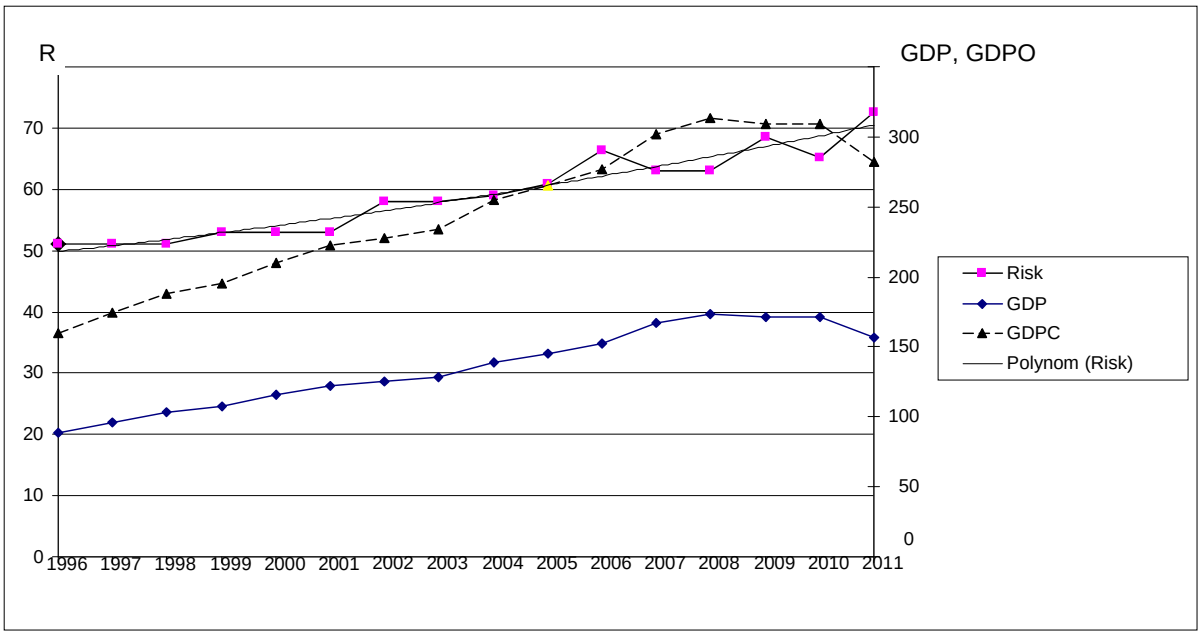

Figure 1 Risk of Regional Economics Development – Hradec Kralove region (1996-2011)
Source: own

The interlaid regression function *R(t)* is a polynomial and has the following form:

$$R(t) = 0.0294t^2 - 116.26t + 115{,}146 \qquad (6)$$

3.2 Characteristics of the Hradec Kralove Region

Regarding the geography of the Hradec Kralove Region, we can say that it is a varied area, which, to a certain extent, defines its position among the other regions of the Czech Republic. The historically conditioned structure of industry, agriculture and services enhance the region's stability. This region neighbours with Poland and the border is more than 200 km long, which contributes to the development of cross-border trade, tourism and cooperation.

The Hradec Kralove Region is situated in the north-eastern part of Bohemia and, together with the Liberec and Pardubice regions, forms the North-East Region, which is one of the Czech Republic's three largest, given both the area and the population. Since 2000 the region has consisted of five districts, namely Hradec Kralove, Jicin, Nachod, Rychnov nad Kneznou and Trutnov. The area of the Hradec Kralove Region occupies six per cent of the area of the Czech Republic and is thus the 9th largest. The region is fifth in regards to the portion of agricultural land and eighth in the percentage of forest land. 84% of the agricultural land of the region is used. The region boasts the Krkonose National Park and three nature conservation zones – these protected areas comprised more than a fifth of the area of the region in 2010. The number of inhabitants of the region represents roughly 5% of the Czech Republic's population. The portion of urban populace reaches 67.6%.

In 2010, the region had the lowest portion of inhabitants between 15 and 64 years of age (69.0%) and the highest portion of inhabitants over 65 (16.5%). The density of the population differs across individual districts (highest in Hradec Kralove 183 inhabitants per square kilometre, lowest in Rychnov nad Kneznou (81)). The Hradec Kralove Region is agricultural-industrial with well developed tourism. The industry is situated in large industrial hubs, while intensive agriculture can be found in the Labe Basin.

The region, according to the Czech Statistical Office, created 4.5% of the Czech

Republic's gross domestic product. The 2010 labour force survey revealed that the total of 253.8 thousand persons were employed in the region (30% of whom worked in the processing industry, 12% in wholesale and retail sale, 9% in the building industry, 7.5% in health and social care, 7% in education, 4% in accommodation, boarding and catering services, and 3.5% in agriculture and forestry etc.). The region is not one of the Czech Republic's major industrial areas, as its share of industrial company takings is around 3% [4]. The increase of the revenues in the industry was accompanied by a decrease of the employment rate in the field; however, the efficiency of work is increasing. Unfortunately, the region's average salary lags behind the national average.

3.3 Characteristics of Pardubice Region and calculation of values of the Regional Economic Development Risk indicator for Pardubice Region in 1996 to 2011

Pardubice Region consists of four districts – Chrudim, Pardubice, Svitavy and Usti nad Orlici – only covering 5.7% of the Czech Republic territory. It is the fifth smallest region.

Pardubice district is the most densely populated one, followed by Usti nad Orlici, Chrudim and Svitavy districts. 60.5% of the total region's area is agricultural land and 29% are woodlands.

With regards to diversity of natural conditions, there are different rates of population density in the individual region's parts and also different shares of agricultural and industrial production. General mechanical engineering is a significant industry, followed by electro-technical, chemical, textile, clothing and leather-processing industries.

From the socio-economic viewpoint, the Pardubice Region belongs among the average regions in the Czech Republic. There is a considerable share of employees in agriculture, which exceeds the nation's average. The number of employees in industry is increasing, but at a slow rate.

In regards to economic performance, Pardubice Region ranks slightly below average.

In the period 2006 to 2011, the region's share in the gross domestic product (GDP) of the Czech Republic gradually decreased from 4.1 to 3.8%, such trend being a long-term one (since 1999).

Also the GDP per capita in the region has been decreasing in the recent years due to economic recession. When compared to other regions, Pardubice Region was in the eleventh place according to GDP per capita in 2011; in 2006, it was in the eighth place. The economic character of Pardubice Region is particularly determined by the secondary sector (industry and construction industry). The decrease in the primary sector, i.e. in agriculture, forestry and fishing, continued.

An increase in the number of economic entities was achieved in the sector of sole traders (increase by 2.0%); also the number of the business companies was increasing (year-on-year increase by 3.2%), particularly the number of the limited liability companies. On the contrary, the number of foreign entities started decreasing (decrease by 7.7%). Only 665 entities seated in the region as of 31 December 2011 had more than 50 employees; 10 entities had more than 1,000 employees, of which only 7 were industrial enterprises. Lack of jobs and the resulting unemployment is an economic and social problem in the region.

For calculation of the Regional Economic Development Risk for Pardubice Region, the same procedure was applied as in the case of Hradec Kralove Region (see chapter 3.1).

The basic data for calculation for Pardubice Region is provided in the Table 10.

Table 10 Values of choice indicators in the Pardubice Region

Year	**GDPC** (CZK)	**NRE** (number of companies/1,000 citizens)	**NIP**(number of citizens)	**NPEA** (%)	**NPEI** (%)	F_{norm} **(-)**
1996	131,275.00	12.17	-752	8.64	49.02	0.297
1997	142,523.00	14.38	-535	8.82	50.09	0.217
1998	154,482.00	15.36	-558	5.87	34.51	0.131
1999	155,385.00	16.60	-627	5.50	32.61	0.068
2000	190,196.00	17.25	-523	6.59	38.92	0.123
2001	203,456.00	18.13	-587	6.34	43.85	0.144
2002	213,622.00	18.90	-577	5.84	45.54	0.128
2003	221,812.00	19.92	-709	6.28	45.53	0.119
2004	240,078.00	20.25	-387	5.91	45.38	0.134
2005	249,765.00	20.57	-259	4.54	43.97	0.167
2006	272,969.00	20.78	84	4.47	45.38	0.250
2007	297,475.00	21.02	575	4.91	44.99	0.391
2008	300,531.00	21.32	665	4.58	45.96	0.373
2009	287,918.00	21.22	641	4.72	45.57	0.188
2010	283,710.00	21.70	401	4.37	44.94	0.195
2011	282,540.00	21.96	16	5.50	61.34	0.304

Source: [4]

On the basis of indicators GDPC, NRE, NIP, NPEA and NPEI, the partial variables H, RP, Po, PZ, PP (in the given order) are defined as a difference between the indicator for the entire country expressed in percents and the indicator for the region expressed in %. Their values are provided in Table 11.

Table 11Values of partial variables for Pardubice Region

Year	H **(%)**	R_P **(%)**	P_o **(%)**	P_Z **(%)**	P_P **(%)**	G **(%)**
1996	14.62	14.62	-6.92	3.68	-23.14	70.34
1997	9.03	9.03	-10.95	4.12	-23.57	78.25
1998	11.30	11.3	-7.51	1.62	-6.93	86.85
1999	23.21	13.11	-7.43	1.53	-3.75	93.21
2000	10.75	13.63	-7.34	2.87	-9.09	87.74
2001	11.57	12.80	-5.14	2.71	-12.87	85.56
2002	11.58	13.27	-3.77	2.19	-14.84	87.18
2003	12.19	12.54	-3.24	2.77	-15.85	88.11
2004	12.94	12.01	-1.65	2.64	-15.87	86.60
2005	14.33	11.73	-0.46	1.33	-14.44	83.28
2006	13.03	12.06	-0.31	1.39	-14.84	75.02
2007	13.14	12.08	-1.67	2.02	-14.31	60.93
2008	15.03	12.55	1.02	1.76	-15.04	62.74
2009	16.69	13.28	-2.03	1.60	-17.07	81.16
2010	18.69	13.36	2.03	1.27	-16.47	80.52
2011	19.05	12.66	4.33	2.55	-32.01	69.59

Source: Own

By application of the procedure specified in chapter 3.1, the Regional Economic Development Risk indicator for Pardubice Region was calculated.

In the monitored period, the values of the Regional Economic Development Risk indicator can be described using attributes ranging from moderate to high risk (Table 12).

Table 12 Risk of Regional Economics Development – Pardubice Region

Year	Value of indicator	Attribute
1996	78	MR
1997	74	MR
1998	81	HR
1999	81	HR
2000	72	MR
2001	72	MR
2002	72	MR
2003	72	MR
2004	72	MR
2005	71	MR
2006	71	MR
2007	72	MR
2008	77	MR
2009	76	MR
2010	78	MR
2011	81	HR

Figure 2 shows the time-related development of indicator *R* in the case study for Pardubice Region together with the development of the gross domestic product and the gross domestic product per capita (in the period 1996 to 2011).

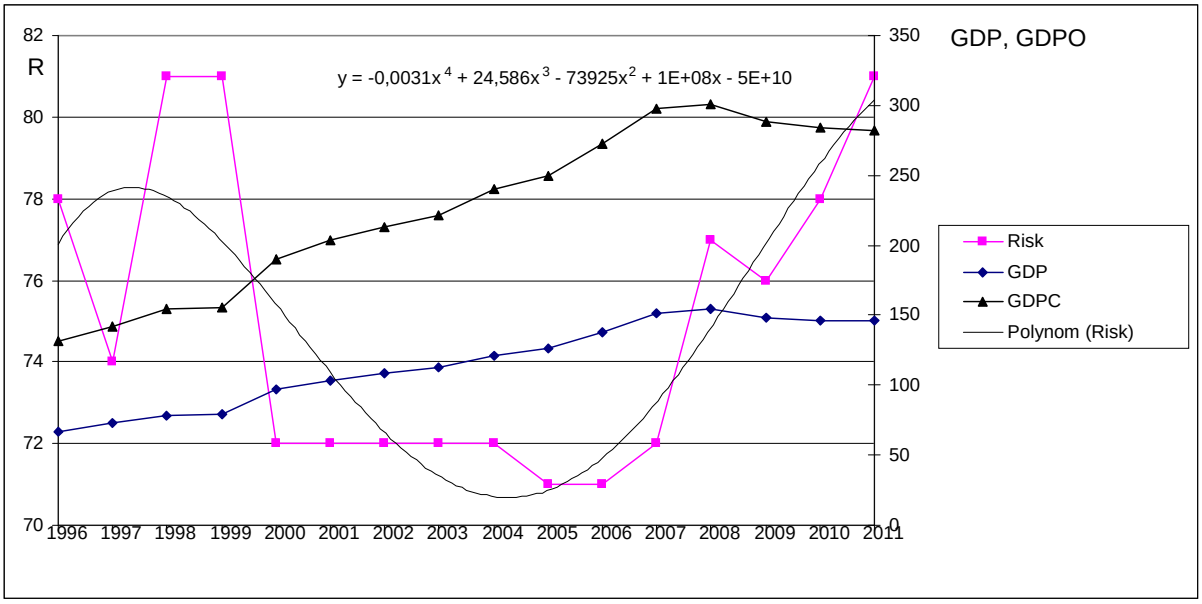

Figure 2 Graph of the Regional Economic Development Risk Indicator for Pardubice Region in the period 1996 to 2011
Source:own

The interlaid regression function *R(t)*, which models the trend of indicator *R*, is a polynomial of degree four and has the following form:

$$R(t) = -0.0031t^4 + 24.586t^3 - 73925t^2 + 10^8 t - 5.10^{10}, \quad (7)$$

where variable *t* represents time in years.

4 Conclusion

The Regional Economic Development Risk Indicator of the Kralove Hradec Region shows an increase risk trend of from 1996 to 2011, because the gradual decrease of some partial indicators (the gross domestic product per capita, the natural increase of the population) contributed to the region's decreasing position.

The gross domestic product per capita has fallen over the last years by 10% or more in comparison with the country's average. It is encouraging that there has not been any major decrease of the number of business subjects in the region, so the number of jobs does not decrease.

An overall assessment using the Regional Economic Development Risk Indicator shows an increase of risk that the region's development will slow down in comparison to the entire Czech Republic. This conclusion is correct given the region's characteristics.

From the business viewpoint, Hradec Kralove Region is a quite stabile region, where demand for labour and sufficiently qualified labour force can be utilised. On the other hand, it is necessary to take into account the possible decrease in the purchase power when making managerial decisions.

Pardubice Region shows slightly higher values of the Regional Economic Development Risk Indicator. These values correspond to the fact that within Pardubice Region, there are areas, which qualify for economically weak regions with a concentrated state support. However the natural conditions and the structure of economic entities may suite small and middle sized businesses.

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