



ANALYSIS OF MACROECONOMIC FACTORS FOR THE ESTABLISHMENT OF INDUSTRIAL PARKS AND THEIR EFFECTS ON REGIONAL DEVELOPMENT: EMPIRICAL STUDY FROM SLOVAKIA

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ABSTRACT

The aim of this study is to identify and analyze the key macroeconomic factors affecting the establishment and entrepreneurship in industrial parks with positive effects on sustainable regional development in Slovakia as member of the EU and euro area. The relationship of dependence between factors of regional growth, investments, and investment costs for setting up industrial parks and effects on regional development is surveyed by variables of the regression analysis (years 2001-2011) and construction of linear regression models to meet real macroeconomic development in Slovakia. To conclude, identified main localization factors relevant to the management of support and establishment of industrial parks in Slovakia are: status of foreign direct investments, employment of persons, governmental financial support – investment incentives, marketing strategy to attract investors, overall readiness and availability of the industrial area with focus on the positive effects of regional development, using regional GDP per capita, in particular to reduce regional unemployment rate.

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JEL Classification: O16.

Contribution/ Originality

In this study, the dependence relationships between the factors of regional growth and investments for setting up industrial parks are investigated by regression analysis for the period 2001–2011 and construction of linear regression models that meet real macroeconomic development in Slovakia. The findings and comparable evidence from practical experience contain

implications for economic governance in many countries that support the establishment of industrial parks, in particular to reduce regional unemployment rate.

1. INTRODUCTION

It can be considered industrial parks as one of the modern phenomena according to the frequency with which more and more business entities, cities, municipalities and regions in the world are reaching after them. With the development of the macroeconomic environment cities have been getting gradually to the discovery of industrial parks. This development is particularly influenced by structural reforms of the economy and the production spheres that are affected by ever stronger competitive struggle within the constantly changing global market space and the impacts of the global crisis. The previous production and industrial structure of economies fell apart; empty or partially empty buildings are not at all rare phenomenon (Balaz, 2001). Existing industrial zones, in terms of empty factory buildings are little attractive, despite the undeniable advantages of existing pre-prepared technical infrastructure. One possibility of their recovery that has been recognized by cities and regions is their use as locations for new production and business activities. Lack of domestic financial resources showed that higher economic growth, structural changes and the implementation of development goals can only be achieved with the participation of foreign funds and foreign capital. Cities, municipalities and regions can offer suitable investment opportunities to foreign investors who are just an important segment of economy.

Investors when deciding on the location of their entrepreneurship in a particular location take into consideration several criteria, known localization factors, conditions (Sklenar, 2004; Capello, 2007; Hudec, 2009). The most important criteria, factors that influence investors in their decision on the location of the business or new company are:

Country: political and macroeconomic stability, the country's credit rating, monetary stability, taxation, investment incentives, investment risk, cultural proximity, geographic location, legislation, level of corruption, law enforcement,

Region: market extent, access to major consumer markets, transport and technical infrastructure, prices of inputs: labour costs, energy costs, material, raw materials, the quality and availability of the labour force and its education, labour productivity,

Location: transport distance and transit costs, efficient logistics, modern infrastructure, supply of industrial zones and areas, costs of land, Self-government: local autonomy, strong institutional support for foreign direct investment inflows, strong support institutions and technical services, favorable conditions for investors and their families.

Foreign investors have according to several international empirical studies more positive impact on entrepreneurship of economies than domestic investors. The reason is mainly that they bring know-how, new technologies, management processes and practices, marketing strategy, increasing competition etc. with them. The most significantly is this effect seen in cases of strategic investment that produce a multiplier effect in the connected sectors. Entry of an investor is often accompanied by the arrival of his subcontractors; in addition also domestic companies can establish

cooperation. By setting up a new Greenfield type of company, investor immediately creates jobs needed to build the company. When an investor invokes the growth in demand for local production and services thereby he indirectly also affects job creation in these companies. Increasing employment can help reduce social problems associated with unemployment.

The Slovak economy grew fastest among the EU (27) countries throughout the past decade according macroeconomic figures (see in Table 2). The country's rapid economic development was strengthened further since the adoption of the Euro currency in 2009 (regardless global crisis), the implementation of a flat tax system (in 2004, corporate tax was 19 %, now is raised) and maintenance of the lowest debt ratio in euro area. The productivity of the Slovak labour force, relative to labour costs is one of the highest in the CEE region (Central and Eastern Europe). Slovakia is widely seen as a success model for other EU countries for creating an investment and business friendly environment. Slovakia is generally recognized as an open market economy, which is able and willing to pay its liabilities. In this study, the research questions are: Which localization factors are considered the most important for investors on establishment of industrial park? What are the main risks of investments and foreign direct investments in the global post-crisis world?

2. THEORETICAL BASIS AND SHORT PRESENT STATUS IN SLOVAKIA

It can be concluded that in the economic theory there are several classifications of industrial parks and their types, highlighting in varying degrees a particular function that the selected area performs in the city or in the region in order to ensure a set of development goals. The industrial park is generally analogous summary of organizational and spatial segments of manufacturing and services. [Ilkovic \(2001\)](#) defined three groups (types) of parks as: *science and technology park*, *science and manufacturing park (technology park)*, *manufacturing and services park (industrial park)*. Broader overview of land-economic groupings stated [Valovic \(2004\)](#) as: *industrial zones*, *higher industrial zones*, *industrial parks*, *logistics platforms*, *innovation centers*, *business parks*, *technology or science and technology parks*, *science parks*.

Taking into account previously mentioned effects *two models* of park functioning can be discussed ([Ilkovic, 2002](#)):

- *Model No. 1* - integral Park is under administration of a municipality, which makes decisions and is responsible for the entity. Given the difficult situation of municipalities this option is in the investor line municipality – municipality not very real. Therefore, the joint stock companies with the participation of strategic investors and municipalities are formed.
- *Model No. 2* - Park operating under an area module for one investor, who obtains land that is tailor-made and investor can immediately start industrial buildings implementation. It is a typical example of the so called development zone, where the zone occupation is happening gradually for several years.

Now, science and technological parks (STP) are the global trend. STP are deemed to be the place where the entrepreneurship is concentrated, new technologies are created, where they are able to transfer and commercialize these technologies, new fast-growing and high-technologically oriented companies are formed there. Because of the STP partnership with universities, governments, private companies, favorable environment for regional development, competitiveness and building of a knowledge-based economy in the country is being originated (Vedovello, 1997; Kitson, 2004). STP is a perfect environment for companies and institutions of the global knowledge economy. The first phase of STP development (from 60s to 80s of the 20th century) began with development of the first centers in California, then in the Massachusetts Institute of Technology (MIT, Boston) and Harvard (Boston). The second stage (from 80s to 90s of the 20th century) is characterized by outsourcing certain activities, with an emphasis on high-tech and advanced technology and parks reorganization. Focus of parks switched from production to electronics and informatics, which can be characterized by the reorientation of parks to advanced technologies. The third phase of development began in the 90s of the 20th century, when it came to the transformation of science and technological parks into the multi-pole chains. STP development is continuing constantly (Besold, 2006).

In Slovakia, within the EU, first science and technological parks are generally based on local initiatives and the focus is more on the different types of incubators, business or technology. Innovative eco-parks with diverse focus, that are using in the most comprehensive volume all innovative effects with respect to all environmental impacts are another upcoming trend (Svejda, 2008). There wasn't established appropriate institutional and regulatory environment for the establishment of industrial parks in the Slovak Republic till 2001. Act No. 193/2001 Coll. on support for the establishment of industrial parks has brought legal rules and defined criteria for their establishment in Slovakia (Lesakova, 2006). Locations for industrial parks are a very sensitive issue, as improper location of the park in a certain area could cause serious damage of various kinds. Moreover, not all areas are because of their characteristic attractive to investors and often it is only the interest from municipalities, cities or investors to obtain financial support. The selection of target groups is possible according to several specifications, e.g. according to the type of production. It aims to offer the specific conditions at competitive prices (Ochotnický *et al.*, 2011).

Essential assumption to attract new investors is the creation of appropriate legislative, fiscal and investment conditions for new arriving companies. SARIO agency (Slovak Investment and Trade Development Agency, 2010), has published ten major reasons why it is profitable to invest and doing business in the Slovak Republic (the advantages):

- Geographic location in the Central Europe (CEE region)
- Political and economic stability, economic growth in the region
- Appropriate tax burden
- Sufficient number of skilled labour
- Low labour costs in relation to the labour productivity
- Euro - the official currency from 1st January 2009 and a member of the euro area

- Large selection of industrial zones, building grounds and offices suitable for sale or lease
- Harmonized investment incentives with the EU legislation
- The quality of infrastructure is constantly improving
- Great innovative potential for science and research projects.

One of the major factors that influence investors about the location of the investment is *the volume and structure of investment incentives* that they can get in the country. In addition to the state support for the establishment of an industrial park by the Ministry of Economy, the city or municipality can apply for aid - *state aid* in the form of investment incentives and investment assistance in the Slovak Republic (Act No. 565/2001Coll. on investment incentives in accordance with later regulations), as well as from the EU structural funds, in the form of funds for the construction and reconstruction of production halls. An updated act on investment incentives – New Investment Incentives (2005 and 2013) brought a new integrated methodology on support for new investors. The new rules substantially increased transparency, objectivity and flexibility in allocating investment incentives. Their basic principle is to mitigate the differences between the regions of Slovakia. The rules are built according to the region's unemployment rate (compared to the national average - in 2012 it was 14.0 %), to which the investment is aiming. In Slovakia, according to the available SARIO data there are currently 78 different types of industrial parks, of which the largest group are Greenfield type of parks, 50 (Vidova, 2011). Brownfield (in existing factory buildings) and greenfield/brownfield type of parks constitute only a small group of 12 parks, we have put 16 parks into groups of unspecified or various types of scientific and technological and logistic parks. According to [Slovak Investment and Trade Development Agency \(2010\)](#) 28 445 new jobs (for years 2003-2009) were created in industrial parks along.

3. METHODOLOGY, METHODS OF THE RESEARCH AND MODEL SPECIFICATION

In this study, the research objective is, whether there is a relationship of dependence between regional development, growth (using regional GDP per capita-Gross domestic product) and foreign direct investments (FDI), investment costs for setting up industrial parks, employment and impact of effects on establishment and operation of parks on regional development. It is investigated in particular the selected macroeconomic factors that define the ability of the industrial parks to positively influence regional development and regional unemployment in certain economic, social and environmental conditions.

For this study, information and data were collected from the scientific and professional economic literature. Additionally, empirical sectoral data from electronic information sources and annual reports from SARIO, reports of the Ministry of Economy of the Slovak Republic (ME SR), individual statistical data from National Bank of Slovakia (NBS), Statistical Office of the Slovak Republic and Eurostat were obtained. To meet the objective of the study following scientific and mathematical and statistical methods were used:

- the method of quantitative analysis, comparative analysis, an empirical analysis, synthesis,
- the statistical method of regression analysis to examine the relationship of dependence with the use of software solutions, a regression modelling, analyzed the period of seven years- the first phase (2005-2011, Table 1) and eleven years-the second phase (2001-2011, Table 2).

The presumptions of the regression analysis, regression modelling and the procedure of the regression analysis:

- the presumption and quantification of linear dependence between the dependent variables (Y) and selected independent variables (X), i.e. parameters from the real Slovak macroeconomic environment, the identification and quantification of factors, exploring dependencies and influences of variables through the regression analysis,
- the analysis whether it is possible to set up a statistically significant linear regression model (Mod) between the dependent variable and independent variables (a multiple linear regression model), which would correspond to the real development in the Slovak Republic,
- the structure and description of the linear regression model by the following equation, expressed by the general equation.

The task of modelling is to estimate the regression coefficient β_n in the equation (Valovic, 2004):

$$y = \beta_0 + \beta_1 \cdot x_1 + \beta_2 \cdot x_2 + \dots + \beta_n \cdot x_n + \varepsilon \quad (1)$$

where:

- y is the value of a dependent, interpreted(explained) variable Y (a criterion) in the observation
- x_1, x_2, \dots, x_n is the value of the independent variable, interpreting X (a predictor) in the observation 1, 2 ... n
- β_0 is the regression constant (an intersection of the regression line with the x-axis)
- $\beta_1, \beta_2, \dots, \beta_n$ is an unknown regression coefficient of the variable X (1, 2 n)
- ε is a random error of the observation.

The regression problem is most commonly addressed by the known method of least squares, which chooses b (estimate of unknown parameters β) so as to minimize the sum of squares of residues e . Based on a sample of n observations of variables X and Y, the method of least squares estimates the unknown parameters β so, that the sum of squared residuals is minimized. *The residue e* is the difference, the deviation between the actual value of the dependent variable y and the value calculated from the regression function by substituting value x . The overall **F-test** of the research hypotheses or the significance of F expresses the significance or reliability of the model as a whole. P-value, *P-test* expresses a probability of the significance of each parameter. Significance level α is 5%, i.e. 0.05. The disadvantage of the linear regression method is missing the nonlinear dependence between variables and other external influences, which was not investigated in this study.

Econometric approach (Volosin, 2006), which focuses on the combination, more specifically on combination of economic theory and empirical experience (empirical data) and quantifies the relationships between economic variables is also used in this study. Econometric modelling has such a sense of economics, which is based on the recognition of economic subjects, from their actual subjectivity in the real economy.

3.1. Data for Regression Modelling and Hypotheses

In the first phase of modelling, empirical data from Table 1 were analyzed for the years 2005-2011.

Table-1. Selected macroeconomic indicators of Slovakia - development for the years 2005-2011 for regression modelling- the first phase.

Factor/variable	X _t	2005	2006	2007	2008	2009	2010	2011
The number of new projects approved under the investment aid	X ₁	18	48	16	5	8	11	15
State aid in Slovakia - grants for projects in thousands of EUR	X ₂	313 395	358 286	171 305	42 665	75 180	49 064	50 050
Unemployment rate in Slovakia %	X ₃	16.2	13.3	11.0	9.6	12.1	14.4	13.5
Employment (VZPS) thousands of persons	X ₄	2 216.2	2 301.4	2 357.3	2 433.8	2 365.8	2 317.5	2 351.4
Number of new jobs created in the Slovakia	X ₅	8 392	15 499	6 113	2 199	2 976	1 350	2 225
FDI in Slovakia in millions of EUR	X ₆	19,968	25,517	29,058	36,226	36,469	37,665	39,207
Regional GDP of Slovakia/capita in EUR	Y ₁	9 154	10 203	11 387	12 381	11 609	11 900	11 750

Source: author's processing and calculations from statistical data of ME Slovakia, SARIO and NBS

Note: VZPS – Selected finding of labour force in Slovakia and the EU

In a further investigation a need to extend (prolong) time series for the usage of the *first differences* of the researched variables occurred. The economic time series were extended to the analyzed period of time of 11 years (2001-2011, Table 2) in the second phase of modelling.

Table-2. Macroeconomic indicators of Slovakia in EU- development for the years 2001-2011 for regression modelling- the second phase

Year	t	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP growth rate in EU (27 countries) %		2.0	1.2	1.3	2.5	2.0	3.3	3.1	0.3	-4.4	2.1	1.5
GDP growth rate in Slovakia %	P ₁	3.5	4.6	4.8	5.1	6.7	8.3	10.5	5.9	-4.9	4.2	3.3
Unemployment rate in Slovakia %	P ₂	19.20	18.50	17.40	18.10	16.20	13.30	11.00	9.60	12.10	14.40	13.50
FDI in Slovakia in millions of EUR	P ₃	6,495	8,563	12,617	16,068	19,968	25,517	29,058	36,226	36,469	37,665	39,207
Regional GDP per capita in Slovakia in EUR	R ₁	6 298	6 843	7 550	8 391	9 154	10 203	11 387	12 381	11 609	11 900	11 750

Source: author's processing and calculations from statistical data of Eurostat, ME Slovakia, SARIO and NBS

In this study, the following researched hypotheses are formulated:

H₁: It is supposed that there is a relationship of dependence between regional growth (GDP per capita), and investments (FDI), investment costs for the establishment and operation of industrial parks in the Slovak Republic and the effects on regional development with a major impact on reducing regional unemployment rate.

H₂: It is expected that on the regional development (through the growth of regional GDP per capita and thus the potential of establishment and effective functioning of an industrial park in Slovakia) these factors have a direct impact: status of foreign direct investments, development of unemployment rate and potential of skilled labour (economically active population, employment).

The calculations were made using software GRETL (GNU Regression, Econometric and Time series Library).

4. RESULTS AND DISCUSSION

4.1. Construction of Models and Interpretation of the Regression Models Results

In the discussion about the researched problems and the establishment of regression models to support the creation of the industrial park with effects on regional development, which would correspond to the real development in Slovakia, several models (Mod) were constructed. and quantify the relationships between selected dependent variables. Also the formulated researched hypotheses were tested. In this study it was worked with relatively short time series, but using in them real economic data from Slovakia.

In the regression modelling in the first phase, selected variables from Table 1 were analyzed, macroeconomic indicators of Slovakia for studying dependability for a period of seven years in various combinations. In connection with searching for an answer for H₁, the parameters of a linear regression model Mod₁ (b₀, b₁, b₂), were estimated, in which the dependent variable was regional GDP/ capita of Slovakia in EUR and the independent variables FDI in Slovakia in millions of EUR (X₆) and the unemployment rate of Slovakia in % (X₃), in Table 3.

Table-3. Model 1: OLS, using observations 2005-2011 (T = 7)Dependent variable: Y_1

	Coefficient	Std. Error	t-ratio	p-value	
const	9867.25	1022.64	9.6488	0.00065	***
X_6	0.117912	0.0160244	7.3583	0.00182	***
X_3	-189.923	53.1955	-3.5703	0.02337	**

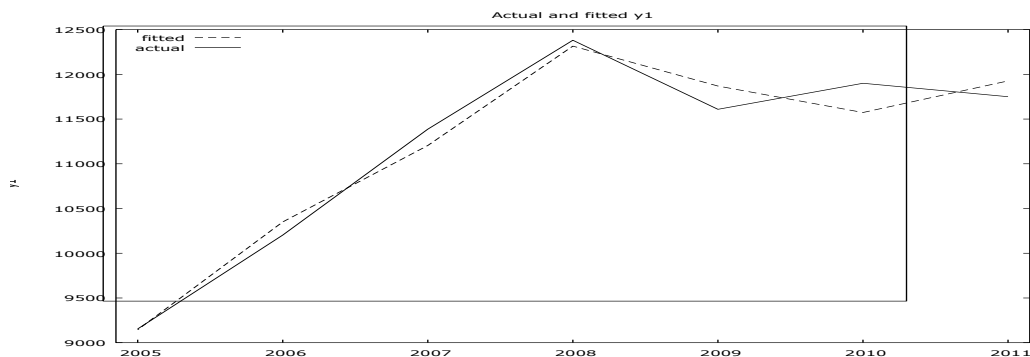
Mean dependent var	11197.71	S.D. dependent var	1123.210
Sum squared resid	264769.7	S.E. of regression	257.2789
R-squared	0.965022	Adjusted R-squared	0.947533
F(2, 4)	55.17874	P-value (F)	0.001223
Log-likelihood	-46.82504	Akaike criterion	99.65008
Schwarz criterion	99.48781	Hannan-Quinn	97.64446
rho	-0.752296	Durbin-Watson	3.210353

Source: author's calculations in the GRETL program

Using the method of least squares, the regression equation in the following form was estimated:

$$Y_1 = 9867.25 + 0.1179 \cdot X_6 - 189.9 \cdot X_3 \quad (2)$$

Model Mod₁ and all the estimated parameters are statistically significant at $\alpha = 0.05$ by t-tests of coefficients and the F-test of the model. Model explains 94.7% of the variability of the dependent variable. Autocorrelation residues, according to Durbin-Watson test is in the range of uncertainty. With the growth of FDI by 1 million EUR, regional GDP/capita is growing by € 0.1179 assuming that other parameters remain unchanged. With the decline in unemployment rate by 1 percentage point regional GDP per capita is growing by € 189.9 assuming constancy of other parameters. This model is economically and statistically significant for the economy of Slovakia and regional development.

Figure-1. Model Mod₁

Source: author's processing in the GRETL program

Testing dependencies in the regression analysis, it was found for H_1 , that significant economic and statistical dependence between the studied parameters of the real Slovak macro environment and impact indicators for regional development has been confirmed (see in Figure1 and Table 5).

Furthermore, in connection with searching for an answer for H_2 the correlation between the other variables and estimated parameters of the linear regression model Mod_2 (b_0, b_1, b_2), in which the dependent variable is regional GDP/capita in EUR and the independent variables FDI in Slovakia in millions of EUR (X_6) and employment (the economically active population in thousands of persons, X_4) was investigated in Table 4.

Table-4. Model 2: OLS, using observations 2005-2011 (T = 7)

Dependent variable: Y_1

	Coefficient	Std. Error	t-ratio	p-value	
const	-10331	5359.26	-1.9277	0.12615	
X_6	0.0882701	0.0232516	3.7963	0.01916	**
X_4	8.0105	2.51953	3.1794	0.03356	**
Mean dependent var	11197.71	S.D. dependent var	1123.210		
Sum squared resid	314285.5	S.E. of regression	280.3059		
R-squared	0.958481	Adjusted R-squared	0.937721		
F(2, 4)	46.17021	P-value(F)	0.001724		
Log-likelihood	-47.42508	Akaike criterion	100.8502		
Schwarz criterion	100.6879	Hannan-Quinn	98.84455		
rho	-0.704465	Durbin-Watson	3.049388		

Source: author's calculations in the GRETL program

Using the method of least squares, the regression equation in the following form was estimated:

$$Y_1 = - 10331 + 0.0882701 * X_6 + 8.0105 * X_4 \quad (3)$$

Based on the F-test of the model the hypothesis about the null value of all parameters of the model was rejected on the significance level $\alpha = 0.05$. Based on the results of partial t-tests the hypothesis about the null values of parameters for X_6 and X_4 was rejected. Model Mod_2 explains 93.7% of the variability of the dependent variable. Autocorrelation residues according to Durbin-Watson test is in the range of uncertainty.

With the growth of FDI by 1 million EUR, regional GDP/capita is experiencing growth of € 0.088 assuming that other parameters remain unchanged. With the growth in employment of 1 000 persons, regional GDP/capita is growing by € 8 assuming that other parameters remain unchanged. However information criteria of parameters prefer and give higher quality to the previous model.

When testing dependencies in the regression analysis, it was also found for H_2 , that also significant economic and statistical dependence between the studied parameters of the real Slovak macro environment and impact indicators for regional development has been confirmed (see in Table 5).

Table-5. Correlation matrix

Correlation coefficients, using the observations 2005 - 2011							
5% critical value (two-tailed) = 0.7545 for n = 7							
Y_1	X_1	X_2	X_3	X_4	X_5	X_6	
1.0000	-0.5840	-0.9087	-0.7011	0.8994	-0.7294	0.9239	Y_1
	1.0000	0.8139	0.2886	-0.4467	0.9565	-0.5599	X_1
		1.0000	0.4455	-0.7172	0.9424	-0.9333	X_2
			1.0000	-0.9239	0.3089	-0.4332	X_3
				1.0000	-0.5082	0.7362	X_4
					1.0000	-0.7666	X_5
						1.0000	X_6

Source: author's calculations in the GRETL program

In the second phase of modelling, the economic times series to *the analyzed period of time of 11 years to use the first differences of observed variables* and used the data from Table 2 were extended. The parameters of a linear regression model Mod₃ (b_0, b_1, b_2) were estimated, in which the dependent variable was regional GDP/capita in EUR (R_1) and the independent variables FDI in Slovakia in millions of EUR (P_3) and the unemployment rate in Slovakia in % (P_2) in Table 6.

Table-6. Model 3: OLS, using observations 2001-2011 (T = 11)

Dependent variable: R_1

	Coefficient	Std. Error	t-ratio	p-value	
const	9386.88	1034.72	9.0719	0.00002	***
P_3	0.134126	0.0132512	10.1218	<0.00001	***
P_2	-194.217	50.0132	-3.8833	0.00465	***

Mean dependent var	9769.636	S.D. dependent var	2220.143
Sum squared resid	574823.1	S.E. of regression	268.0539
R-squared	0.988338	Adjusted R-squared	0.985423
F(2, 8)	338.9948	P-value(F)	1.85e-08
Log-likelihood	-75.35990	Akaike criterion	156.7198
Schwarz criterion	157.9135	Hannan-Quinn	155.9673
rho	-0.190043	Durbin-Watson	2.107465

Source: author's calculations

Using the method of least squares, the regression equation in the following form was estimated:

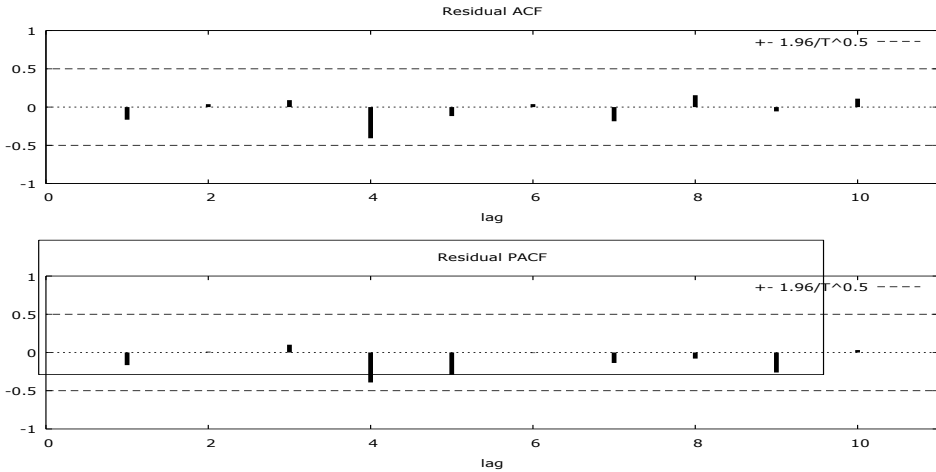
$$R_{1,t} = 9386.88 - 194.217 \cdot P_{2,t} + 0.134126 \cdot P_{3,t} \quad (4)$$

According to F-test the model is statistically significant at the significance level of $\alpha = 0.05$. At this level, according to t-test all model parameters are statistically significant. The value of Durbin-Watson statistics indicates the absence of autocorrelation of residues, as confirmed by Correlogram 1. According to tests performed in the model heteroskedasticity of residues is not presented and residues are normally distributed (accepting the null hypothesis of White test and normality test).

Model explains 98.5% of the variability of the dependent variable. Estimates of parameters have the expected dependence direction. With the decreasing in unemployment by 1 percentage

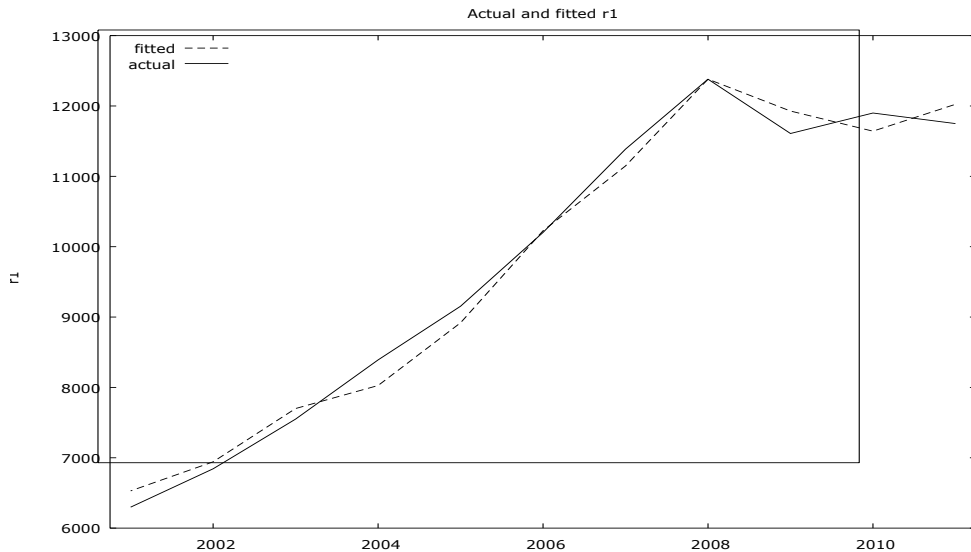
point, regional GDP/capita is growing by € 194.2 (assuming that other parameters remain unchanged). With the growth of FDI by 1 million of EUR, GDP/capita is growing by € 0.134. Model Mod₃ is theoretically, economically and statistically most important and most accurate for use in practice.

Figure-2. Correlogram 1



Source: author's calculations in the GRETL program

Figure-3. Graphic of the Mod₃ model



Source: author's calculations in the GRETL program

Based on the conducted analyzes, it can concluded that there is a confirmed response relationship between regional growth (through the development of regional GDP/capita), and investments (FDI), investment costs of setting up, financing (through subsidies and state aid, but

not presented in this study) and operation of industrial parks in Slovakia and effects and economic impacts of the establishment of parks on regional development. Largest real positive effects on regional development are related to flow of foreign direct investment to Slovakia, increase of volume of investments from investors to the industrial park (Kiseľaova and Kiseľák, 2009) and increase of employment, that later have positive impact on reducing regional unemployment and on regional development. Some by studied factors and constructed regression models (not surveyed in this study) were neither economically nor statistically significant, therefore couldn't interpret them for the analyzed period of time. On the other hand, indicators of the real macroeconomic environment in Slovakia were used, which reflect the real trend and can be used in management practice in other countries. The results may therefore be useful for economic governance challenges of regional development in managerial practice.

4.2. Discussion to the Empirical Results

Based on the processed research part of this paper in relation to management support for the creation of industrial parks and their funding following conclusions could be reached. Main findings: The main macroeconomic factors important for the establishment and management of industrial parks in Slovakia are:

- macroeconomic stability surveyed through real GDP growth rate (regional GDP per capita - interrelationship to others factors and statistically significance confirmed in regression models),
- the volume of investments of established investors –status of FDI (interrelationship statistically confirmed),
- sources of establishment of costs financing, i.e. state subsidies and state aid (investment incentives) and legislative framework to acquire and maintain of investors (not surveyed in this study),
- the economically active population, supply of qualified employment, effective recruitment policy and job creation (interrelationship statistically confirmed in models),
- reduction of the regional unemployment rate (interrelationship statistically confirmed in models).

Subsequent factors are:

- overall readiness and availability of the industrial area in the region for investors ,
- effective selection of potential investors as factor of acquiring of foreign and domestic investors and their subcontractors (enterprises),
- marketing strategy of cities and municipalities when establishing industrial zones,
- localization (type of park), geographical and environmental conditions of the region,
- legally settled land ownership (ownership type),
- input prices and production innovative potential of the industrial park and the region.

These factors have a significant positive impact on sustainable regional development. These results can be associated with findings of Sklenar (2004), which suggested the most important

criteria, macroeconomic localization factors affecting investors according Hudec (2009) and Capello (2007), with impacts on economic growth (Azman-Saini and Baharumshah, 2010).

Industrial parks can significantly contribute to regional disparities reduction, particularly to reduce regional unemployment rate - this finding was statistically confirmed. This result is consistent with findings of Vidova (2011), who suggested establishment of industrial parks as one of tools of reducing unemployment rate and new jobs creation. Positive impact of foreign direct investments on the development of local firms and domestic industry was analyzed in study by Barrios (2005) and can be associated with findings and positive effects on small and medium-size enterprises in this paper. Impacts of firm heterogeneity on spillover effects of FDI and development of firms were investigated in the study by Damijan (2013), with interesting results for economic governance contrast with previous empirical works. Regions should focus on exploiting its competitive advantages and to specialize in certain economic activities that are beneficial for the economy and the competitiveness of the region (Kern, 2005). The need for change in marketing strategy and image of cities universities and research institutions in regions with industrial parks, competitive advantage over other, positively perceived by potential investors according Stefko (2012).

Based on the synthesis of the main results in the management of the establishment of the industrial parks, these conditions and main *positive effects* were specified:

- Industrial parks contribute greatly to the improvement and revitalization of the overall economic situation of the region or country, to regional development (impact on the generation of regional GDP).
- Source of foreign investment flow, capital, transfer of technology, know-how, the recovery of the overall business environment (establishment of foreign and multinational companies).
- Their great importance for regional labour market and job creation, incurred by investor's activities (reducing regional unemployment rate).
- Creation of favorable conditions for entrepreneurship, economic freedom, for the development of domestic small and medium enterprises, the application of modern technologies in the production and manufacture of high technology products, focus on companies generating higher added value, creating subcontracting networks with large businesses.
- Significant economic tool for creating favorable investment environment for foreign investment (FDI), which is becoming competitive not only between regions in Slovakia, but also in the EU.
- Factor of human resource development and development of labour market - the improvement of modern management systems, processes and skills.
- Centre and tool of innovative incentives and initiator for scientific and technological changes, increasing support for innovative business, product and technology innovation to enhance competitiveness and support export growth.

- The impact on improving construction of traffic, local and technical infrastructure of the region, access to EU transport networks, accessibility as a determinant of investors allocation, readiness of the region for the establishment of the investors.
- Factor of the development of international cooperation, cross-border cooperation and tourism.

Some *negative effects* of the establishment of the industrial parks and main risks:

- Inappropriate location of the industrial park can have serious consequences on the environment.
- Existing dependency of the region and companies on the presence of large strategic enterprises and foreign investors as employers.
- Companies' sale problems related to the processes of globalization, economic and financial crisis and recession of the global economy with the consequence of reducing employment.
- Investors leaving to countries with even lower production and labour costs - Romania, the Ukraine, China (increase in average monthly salary in Slovakia after joining the euro area compared to other EU countries).
- Using state regional financial aid resources in the form of investment incentives for foreign investors at the expense of domestic investors.

5. CONCLUSIONS

This study identified and analyzed the key macroeconomic factors essential to the management of the establishment of the industrial parks in Slovakia and their effects on entrepreneurship and regional development using regression modelling. According the results and findings, many important localization factors can be utilized in the management of the establishment of the industrial parks in other EU countries on the basis of the existence of related economic proportions and common relationships. The task to acquire and maintain the strategic investments and investors is particularly topical problem in many countries. The concept of the establishment of industrial parks, eco-parks, and science and technology parks and green investments is one of the core preconditions for sustainable regional development, *the inflow of new investments with higher added value*, as well as for the development of research and development activities and innovation within the competitiveness of regions (Hollander, 2009). In case of successful entrenchment of many foreign investors, it is gradually coming to fulfillment of capacities for potential development of areas, also to the effective usage of human resources capacities, but on the other hand often is increasing dependence of regions on the presence of large multinational enterprises. Increased risk due to the possible outflow of foreign investors to countries with even lower production costs can be reduced through diversification of economic activities in the region. Looking forward as the most promising seems to be a knowledge-intensive activities development, characteristic by high

added value, high innovations volume and high degree of development of human potential, which may be located in industrial parks.

Job creation is one of the priorities of economic policy in Slovakia, which would eliminate the negative impact of the global economic and financial crisis as highlight Heckova and Chapcakova (2011). Economic growth in many countries is far too slow to create enough new jobs. Euro zone debt problems remain one of the key obstacles on the road to recovery of the global economy and increase of global competitiveness. The findings of this study compared with practical experience indicate some implications pertaining to economic governance in many countries, supporting the establishment of industrial parks as tool of sustainable regional development.

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