INVESTMENT INCENTIVES: ANALYSIS OF NEW JOBS, CORRELATION OF NEW JOBS AND THE UNEMPLOYMENT RATE

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Abstract

This article was created thanks to support of the project the students grant competition (SGS), realized within the faculty of Economics of the Technical University of Liberec. In the opening part the article analyses General investment incentives awarded in the Czech Republic. It lists all types of granted incentives and defines the support the creation of jobs in more detail. The other part of the article is focused on analysis of the newly created jobs from the supported projects according to the number of new jobs in each of the years, according to the number of jobs for the reference period according to regions and according to the industrial sector in which the jobs were created. The newly created jobs are also analyzed according to the country of origin of the investment. In the final part the relationship of the unemployment rate and the number of newly created jobs is defined. The relationship is specified by using the test based on the basis of simple regression model.

Introduction

From 1th May 2000 the law No 71/2000 Coll., on investment incentives, came in the effectiveness. This law regulates investment incentives that the investors in the manufacturing industry can ask through the agency CzechInvest. One of the variants of investment incentives is also the aid for newly created jobs. The aim of the article is to analyze the jobs created in the period from 1998-2011 and define their importance for the labour market in the Czech Republic, respectively, for the rate of unemployment in the Czech Republic. It has been done since 1998 because from this period the system of investment incentives in the Czech Republic was introduced.

1   Investment incentives in the Czech Republic

The purpose of the investment incentives is to support the establishment or expansion of production in the manufacturing industry and support the projects in the area of strategic services and technological centres. The incentives are offered to the Czech as well as to foreign investors. The issue of investment incentives in the Czech Republic is covered in a number of legal regulations. The process of providing for foreign and domestic investors, the general conditions and the exercise of state administration is solved by the law on investment incentives, No 7/2000 Coll., on investment incentives, as amended.

1.1 Tools of investment incentives in the Czech Republic

The tools which are determined by the law on investment incentives belong to the category of investment incentives in the Czech Republic. Provided that the statutory conditions are observed, it is possible to provide the following investment incentives:

- tax credit on income tax;

- transfer of technically equipped territory at a preferential price;

- tangible support for the creation of new jobs;

- tangible requalification or training of personnel;

- the transfer of land by a special legal regulation, registered in the cadastre as agricultural land and transfer of other types of land, and at the prices recorded under a special legal regulation.

Fiscal investment incentives in the form of tax credit are covered in the income tax act. According to the current legislation it is possible to apply a tax credit in the period of five consecutive immediately following tax periods. Transfer of technically equipped territory at a preferential price represents the acquisition of so-called industrial zones from municipalities, counties or developers that received the state subsidy for their construction. Tangible support for the creation of new jobs in this case means the direct financial grant for the creation of new work places. [1].

1.2 Provision of investment incentives

According to the law on investment incentives, investment incentives are promised to investors on the basis of the decision on the promise of investment incentives. The process of providing consists of two phases, it means two separate administrative procedures and each of them is ended by the administrative act. It's an offer for the provision of investment incentives and the decision on the promise of investment incentives. The granting of investment incentives on the basis of the decision is preceded by the assessment of the investment project of the applicant, and that in the phase prior to the offer to distribute incentives. Only the Ministry of finance, the Ministry of labour and Social Affairs expresses to incentives before issuing the final decision. The Ministry of finance controls the general terms and conditions and the information in the tax return and verifies the calculation of tax abatements, with regard to other types of public aid granted. [2]

All investors shall submit their applications only through CzechInvest. It is the Agency for the support of entrepreneurship and investments and it was founded in 1992. CzechInvest task is to assist in the implementation of the investment projects, to inform about the possibilities of support for small and medium business, to lead advice to projects to assist companies that has already made investment in the Czech Republic, to facilitate public investment aid, to support the subcontractors, to manage a database of Czech supplier firms, etc. [3]

Investment incentives can obtain a company or a natural person, provided that it meets the general conditions which are laid down in the law on investment incentives, the special conditions laid down in the specific legislation governing investment incentives, for example. the income tax act or employment law. [1]

1.3 Support of new jobs

The Ministry of labour and Social Affairs implements investment incentives to the processing industry in cooperation with the Ministry of industry and trade and the agency CzechInvest. The system of investment incentives includes two incentives related to employment:

- financial support for new jobs,
- financial support for training and retraining.

Financial support may be paid according to the agreement signed between the Ministry of labour and Social Affairs of the Czech Republic and the investor on the basis of the decision on the promise of investment incentives. Material support is usually applied to jobs created and the costs of training incurred in the first three years of the project. [4]

The following table shows the maximum amount of financial support for the jobs and retraining according to the regions.

Tab. 1: *Financial support for the new jobs and retraining according to the regions*

Type of region	Financial support for the new jobs	Financial support for training and retraining
A	50 000 CZK	25% / 35% / 45 % big / medium / small
B, C	any	any

Source: [4]

The amount of aid shall be 50,000 CZK for one new post set up on the territory of the country with a rate of unemployment of at least 50% higher than the average rate of unemployment in the Czech Republic. The type of region A – these are e.g. the districts of Děčín, Ústí nad Labem, Most, Hodonín, Jeseník, etc.

Support for the retraining and training of staff is provided only on the territory of the districts with a rate of unemployment of at least 50% higher than the average rate of unemployment in the Czech Republic. In the amount of 25% of the costs incurred in retraining and training for large enterprises, 35% in the case of medium-sized firms and 45% of the cost if the applicant was a small business. [5]

2 Analysis of new jobs

Tab. 2: *The development of the number of projects, investments and newly created jobs in years 1993-2011 [4]*

Year	Number of projects	Total investments in mil. CZK	Number of newly created jobs	Year	Number of projects	Total investments in mil. CZK	Number of newly created jobs
1998	5	23323.14	1 609	2005	57	40891.39	9 520
1999	16	18148.62	4 850	2006	149	111927.91	30 268
2000	23	48672.98	10 234	2007	55	31105.74	7 471
2001	47	61667.26	13 392	2008	114	88208.44	17 326
2002	39	53731.52	8 507	2009	35	15391.71	8 724
2003	31	29234.88	10 249	2010	13	4778.64	1 101
2004	31	54247.04	8 689	2011	24	16371.93	5 327
				$\sum$	639	597701.20	137 267

Source: [4]

A major contribution of investment incentives and inflows of foreign direct investment is increase of employment. The creation of new production factories, under the leadership of foreign investors, brings of course also creation of new free jobs. [6]

Data on the number of jobs for the purposes of this summary are taken from the investment plans submitted to CzechInvest once a project is launched in the Czech Republic.
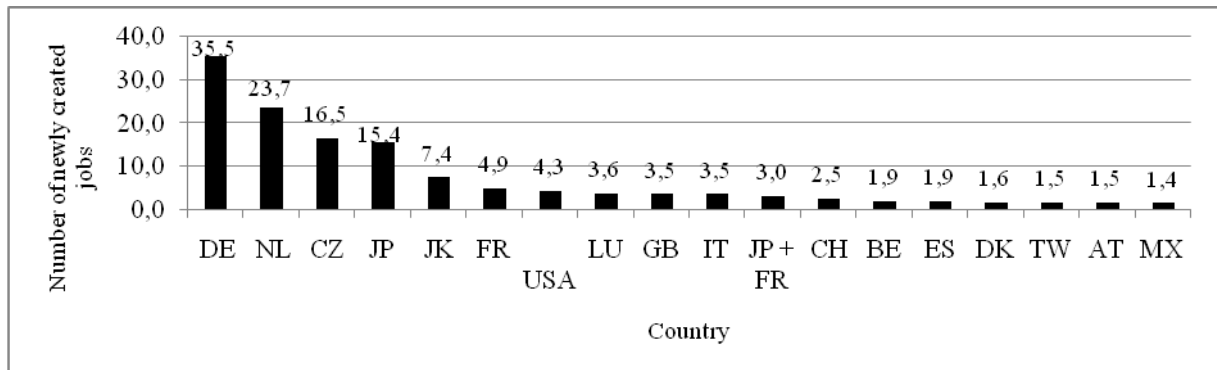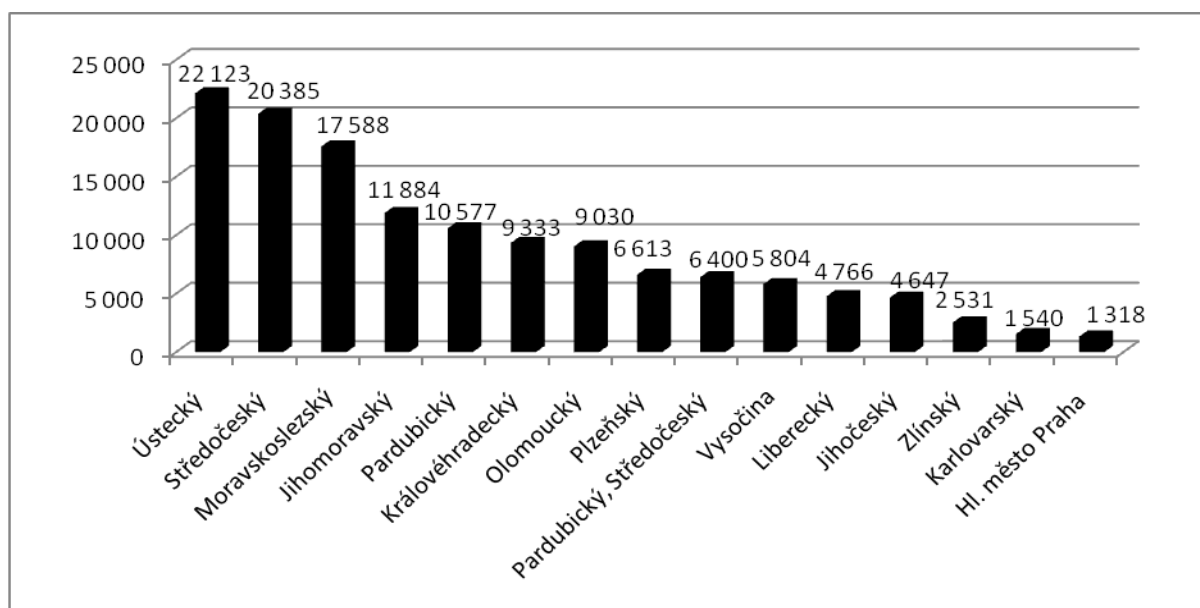

Source: [7]
Fig. 1: *Promised newly created jobs according to the projects by country of origin in years 1998 – 2011*

The total investments made in the Czech Republic in the past 18 years have reached above 715 194 billion CZK and 228 378 new jobs were created. From the table it is apparent that in recent years there has been a reduction of the annual amount of the investments and the newly created jobs. This decrease can be attributed to the global recession. However, in the last year there was a moderate rise in the total investments and the number of new jobs detected again.

Data of the number of jobs for the purposes of this summary are taken from the investment plans submitted to CzechInvest once a project is launched in the Czech Republic

According to the investment projects in years 1998-2011 the largest number of new jobs should bring the investment from Germany, which is 35.5 thousand, the Netherlands, 23.7 thousand, the Czech Republic 16.5 thousand and Japan 15.4 thousand.


Source: [7]
Fig. 2: *The number of promised newly created jobs according to the projects by region in years 1998-2011*

The following figure shows the number of pledges for newly created jobs on the basis of the investment projects according to the individual regions in the Czech Republic. The regions with the highest number of new jobs were selected.

According to the investment projects submitted to the agency CzechInvest, the aid should be based on investment incentives, which created in the Czech Republic total 137 267 new jobs in years 1998-2011. The most jobs should be created in the region Ústí nad Labem 22 123, Středočeský region 20 385 and in Moravskoslezský region 17 588. Ústecký a Moravskoslezský region are the regions where unemployment is higher than the average rate of unemployment in the Czech Republic. On the contrary, Středočeský region is one of the regions with low unemployment, nevertheless on the basis of investment incentives there was created the majority of the jobs.

The following figure shows the number of pledges for newly created jobs on the basis of submitted investment projects according to the individual sectors of the Czech Republic. The sectors where should be created the most jobs were selected.
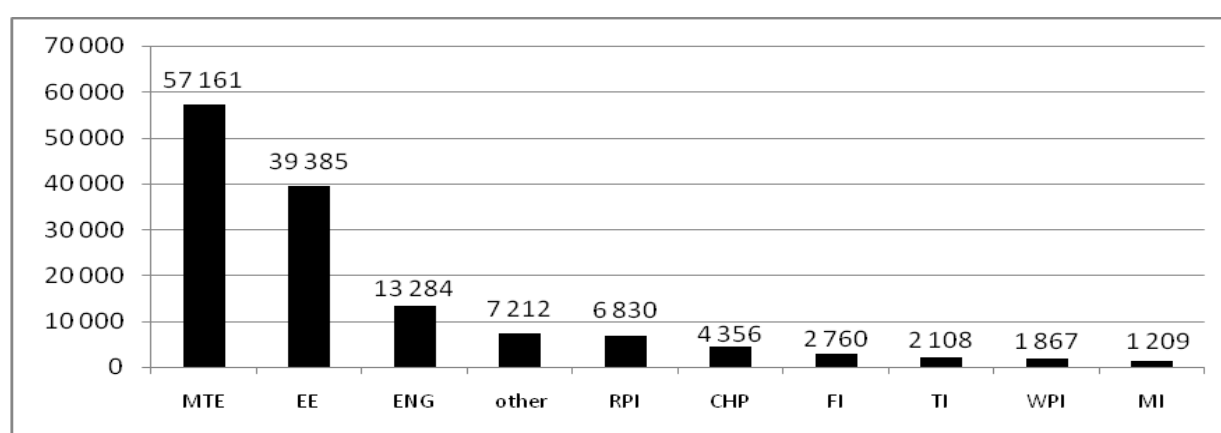
Abbreviation	Explanation	Abbreviation	Explanation
MTE	manufacture of transport equipment	CHP	chemical and pharmaceutical
EE	electronics + electro technical	FI	food industry
ENG	engineering	TI	textile industry
other	other industry	WPI	wood-processing industry
RPI	rubber and plastic industry	MI	metalworking industry

Source: [7]

Fig. 3: *The number of promised newly created jobs in the Czech Republic in years 1998 – 2011*

The most jobs should be created with the support of investment incentives in 1998-2011 in the manufacture of transport equipment and electronics industries, in the engineering and the rubber industry. On the contrary, the lowest number of new jobs should be created in the metalworking industry and wood-processing industry.

## 3 Correlation of newly created jobs and the unemployment rate of the Czech Republic

The goal of this article is to identify the relationship of unemployment rate and the creation of new jobs. How the behaviour of investors on a rising (falling) unemployment in Czech Republic and whether the support of new jobs can reduce unemployment.

3.1 Unemployment rate in Czech Republic

General unemployment rate was chosen as an indicator for evaluating relationship between unemployment and newly created jobs. It is defined by Czech Statistical Office as following:

"The general unemployment rate (ILO) is calculated by dividing the number of unemployed in the total labour force (in percent), where the numerator and denominator are indicators constructed according to international definitions and recommendations (Eurostat and ILO). These are estimates from Labour Force Survey. The subject of investigation is usually all people living in private households. The survey does not cover people´s living in long-term accommodation facilities. For this reason, data on certain population groups, particularly foreign nationals living and working in the country, available to a limited extent." (ČSÚ, 2012)

Unemployment in the periods 1998-2011 is illustrated in the following figure (Fig.4). From the figure it is evident that the highest unemployment rate was recorded in 2000, while the lowest in 2008. The trend is illustrated on figure 4.
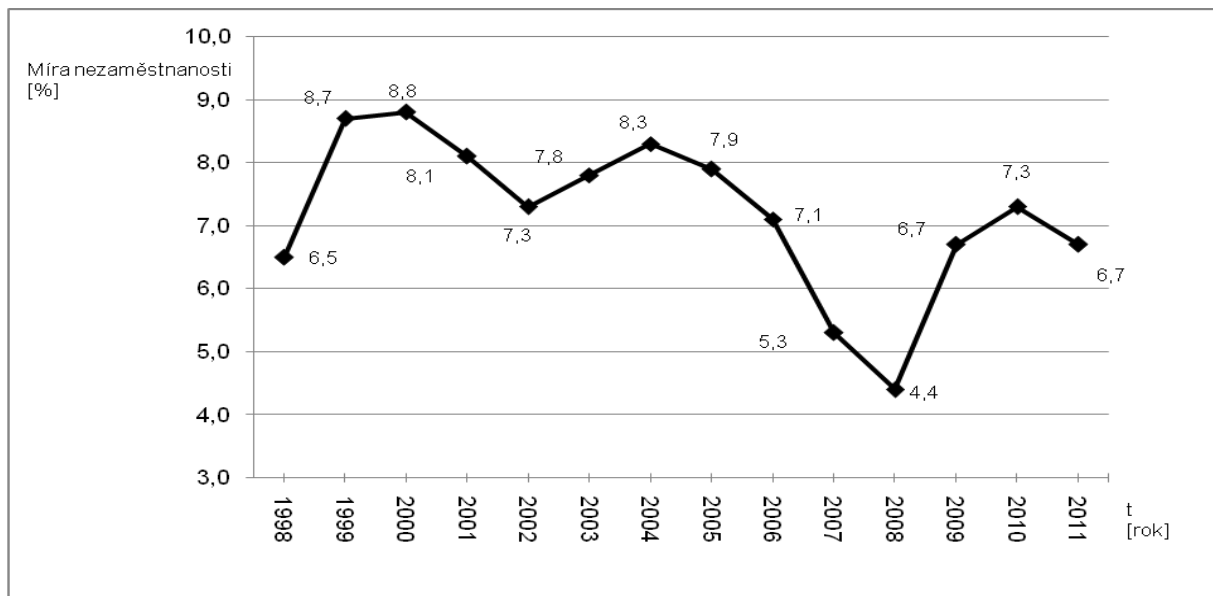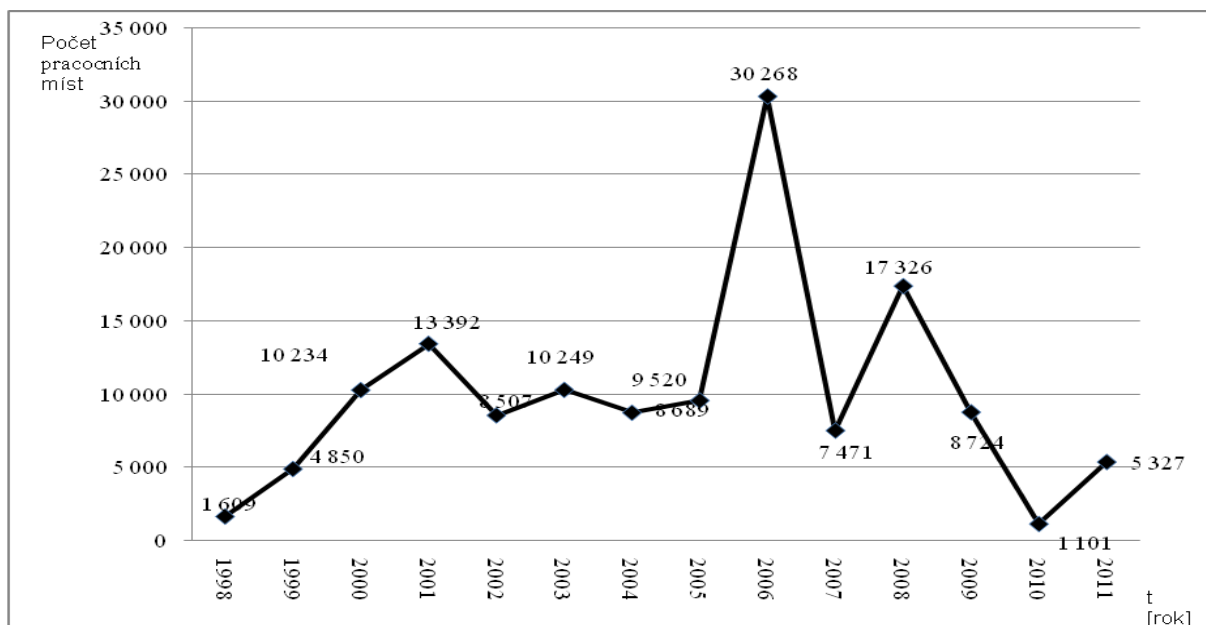

Source: [8]

Fig. 4: *Development of general unemployment*

Before the evaluation of the relationship it should be noted that the promised number of jobs couldn't be realized in the year of declaration. A delay must be assumed.

If we compare the trend of unemployment with the number of jobs in each year, it can be said that it has a close relationship. In the beginning there are the same development curves. The unemployment rate develops similarly to the number of new jobs, both growing. However, in 2001 and 2002 there were formed relatively a large number of new jobs and unemployment was growing. Then, it is that in the years 2003 – 2005 it was created fewer jobs and unemployed rising compared to the previous period.

The main fluctuations can be observed in 2006, when there was a large increase in newly created jobs (30 268) and there was also a consequent reduction in unemployment (in 2006 by 0.8% and in 2007 to 1.8%). A similar phenomenon can be observed also in the year 2008 when it was created 17 326 jobs and unemployment was reduced by 0.9%.

In the following years the economic crisis began to influence the labour market. The number of newly created jobs decreased and unemployment rate grew. In 2011 the general unemployment rate is lower and there are again more new jobs than in the previous year.

Fig. 5: *Development of the number of new jobs*

3.2   Depending test

The following section compares the relationship of the new jobs and unemployment rate. The depending test is based on a simple regression model. It is tested whether the variable relationship really exists. We used information from table 1 and 4.

The result of our depending test is illustrated by figure number 4. Where *y*-axis is the dependent variable (unemployment rate) and *y*-axis is independent variable (number of jobs). There is a regression line in the figure number 4 too. The trend of dependence is shown by the regression line. Its slope determines the correlation coefficient *r*. If the correlation coefficient is less than zero (negative), it means that *y* (dependent variable) decreases with increasing *y* (independent variable) and vice versa. The relationship is stronger and the regression function is better if the dependent variable values are closer to the regression line.

The correlation coefficient was calculated according to equation (1).

$$r_{yx} = \frac{s_{xy}}{\sqrt{s_x^2 \cdot s_y^2}} \tag{1}$$

The degree of dependence is expressed by the coefficient of determination, calculated according to equation (2) and evaluated according to table 3.

$$R_{yx}^2 = 1 - \frac{S_e}{S_t} \tag{2}$$

where S_e means the share of the residual sum of squares, and S_t means total sum of squares.

Tab. 3: *Rating dependence according to R^2*

$R^2 < 10\%$	tightness low
$10\% \leq R^2 < 25\%$	tightness mild
$25\% \leq R^2 < 50\%$	tightness notable
$50\% \leq R^2 < 80\%$	tightness large
$80\% \leq R^2$	tightness very large

In the linear regression model with the absolute member the value of R^2 is in the interval <0; 1>. It indicates proportion of the variance in the observation of the dependent variable regression was able to explain. If the dependence is functional it takes the value, in the case of independence it takes the value 0. The closer to one it is, the stronger dependence is considered, and thus capturing a well-chosen regression functions.

3.3 Test results

After calculating the correlation coefficient, we found that for the relationship the correlation coefficient takes the value of –0.135 and a coefficient of determination takes 0.018 (i.e. 1.8%).
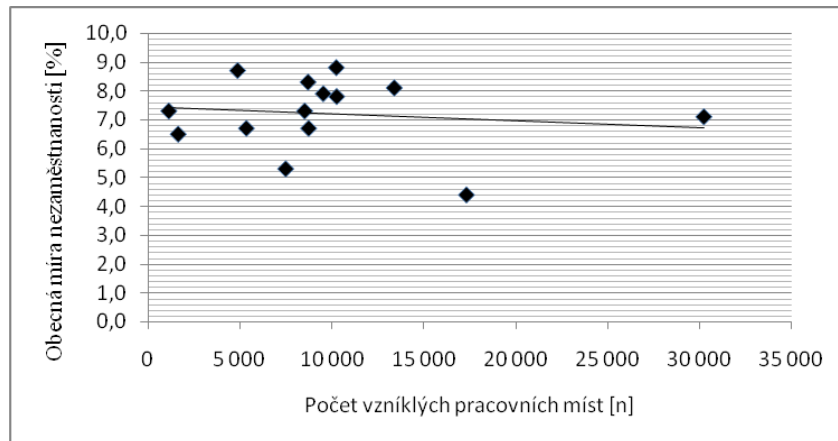
Source: own

Fig. 6: *Depending test of the unemployment rate and new jobs I*

These values belong according to table 3 to the low tightness ($R^2 < 10\%$) and this means that the relationship is not firmly established. A negative correlation coefficient means that as a growing number of jobs unemployment is falling. Evaluating the density values by the naked eye around the line, there is also considered a weak correlation.
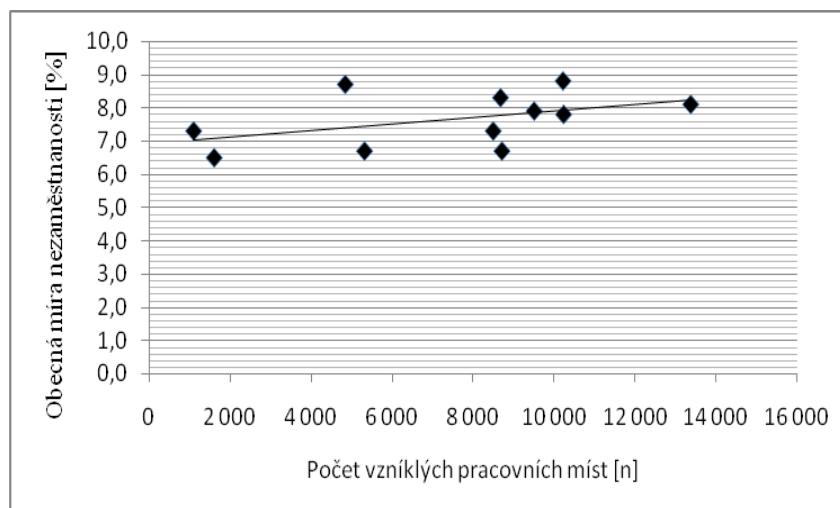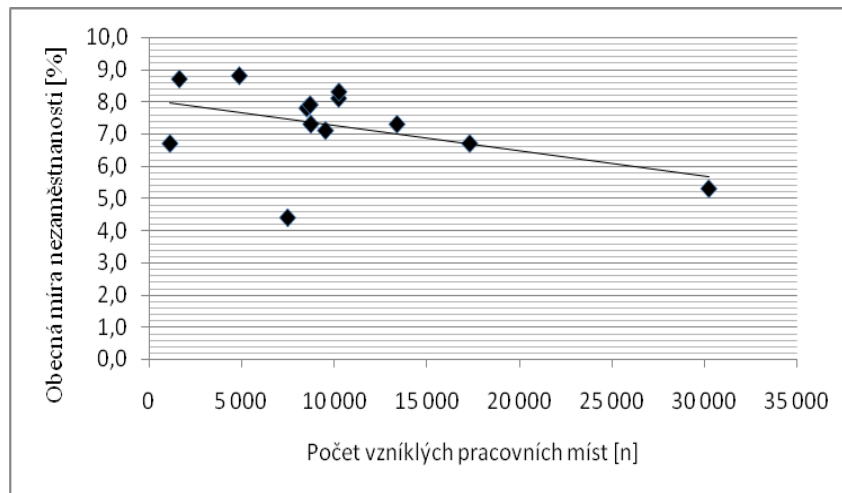

Source: own

Fig. 7: *Depending test of the unemployment rate and new jobs II*

For the next testing, we attempted to eliminate extremes (dates from 2006, 2007 and 2008). After elimination correlation coefficient was calculated 0.464 and coefficient of determination was calculated 21.5%. Unlike the previous test correlation coefficient is positive. It means positive relationship of dependence (whit an increasing number of new jobs unemployment

grows). Based on these results the elimination of extremes is not suitable for our testing. Figure number 7 shows results.

Fig. 8: *Depending test of the unemployment rate and new jobs III*

As a next variant of the test, we decided to take into account the assumption that not all new jobs must be realized in the year of investment. We tried to shifted the data against each other for one year (number of newly created jobs ate correlated with the unemployment rate in tje next year). In this case, correlation coefficient was calculated -0.461 and coefficient of determination was calculated 21.2%. It is mild tightness. Figure 8 shows the results.
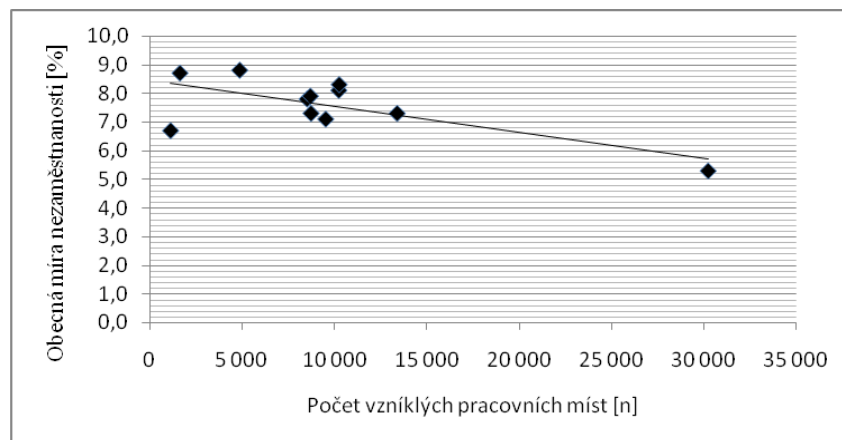
Fig. 9: *Depending test of the unemployment rate and new jobs VI*

We can see one extreme on figure 9. We tried eliminate it (it is year 2008). After elimination this extreme, we calculated correlation coefficient -0.705 and coefficient of determination 49.7% - It is notable tightness. There is the strongest relationship (fig. 9).

Conclusion

The article described the tools of investment incentives and forms of support for the creation of the new jobs based on new investment projects. The current development is illustrated by the graphs and tables. It can be said that the most of the projects supported with investment incentives originated in 2006 and 2008. In these years there were also created the highest number of the new jobs. Overall in the period 1998 – 2011 there were created 639 projects (total 597 701.20 million CZK) and 137 267 new jobs were created.

The most new jobs were created by the investments from Germany, Netherlands and the Czech Republic. The most supported regions were Ústecký, Středočeský and Moravskoslezský. The most supported industry sectors were manufacture of transport equipment, electronics + electro technical and engineering.

The next part of the article described the relationship of the new jobs and unemployment rate. Interdependence was statistically tested by the regression model. We made test. Firts, we tested dates from monitoring period. In the second test we eliminated extremes. The third test, we took into account the assumption that not all newly created jobs are executed in the year of investment and therefore the data was shifted for one year. The highest correlation was found in the event of shift data and the elimination of extremes.

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INVESTIČNÍ POBÍDKY: ANALÝZA NOVÝCH PRACOVNÍCH MÍST, KORELACE POČTU NOVÝCH PRACOVNÍCH MÍST A MÍRY NEZAMĚSTNANOSTI

Tento článek vznikl díky podpoře projektu Studentské grantové soutěže (SGS), realizované v rámci Ekonomické fakulty Technické univerzity v Liberci. Článek se v první řadě analyzuje obecně investiční pobídky udělované v České Republice. Vyjmenovává všechny typy udělovaných pobídek a podrobněji definuje podporu vzniku pracovních míst. Dále článek analyzuje nově vzniklá pracovní místa z podpořených projektů a to dle počtu pracovních míst v jednotlivých letech, dle počtu pracovních míst za sledované období dle regionů a dle průmyslového odvětví, ve kterém pracovní místa vznikala. Dále jsou také nově vzniklá pracovní místa analyzována dle země původu investice. V poslední části je definován vztah míry nezaměstnanosti a počtu nově vzniklých pracovních míst. Vztah je určen pomocí testu závislosti na základě jednoduchého regresního modelu.

INVESTITIONSANREIZE: ANALYSE NEUER ARBEITSSTELLEN; KORRELATION ZWISCHEN DER ANZAHL NEUER ARBEITSSTELLEN UND DEM MASS DER ARBEITSLOSIGKEIT

Dieser Artikel entstand auf Grundlage des Projekts „Studentische Grant-Wettbewerbe", das im Rahmen der Ökonomischen Fakultät der TUL durchgeführt wurde. Der Artikel analysiert in erster Linie allgemein in der Tschechischen Republik erteilte Investitionsanreize. Er zählt alle Typen von erteilten Anreizen auf und definiert ausführlich die Unterstützung der Schaffung von Arbeitsplätzen. Weiters analysiert der Artikel aus unterstützten Projekten neu entstandene Arbeitsplätze, und das nach der Anzahl der Arbeitsstellen in den einzelnen Jahren, nach der Anzahl der Arbeitsstellen im Verlauf des beobachteten Zeitraums, nach Regionen und nach dem Wirtschaftszweig, in welchem die Arbeitsplätze entstanden sind. Weiter werden neu entstandenen auch nach den Herkunftsländern der Investition analysiert. Im letzten Teil der Arbeit wird die Beziehung zwischen dem Maß der Arbeitslosigkeit und der Anzahl der neu entstandenen Arbeitsstellen definiert. Die Beziehung wird mit Hilfe eines Abhängigkeitstests auf Grundlage eines einfachen Regressmodells bestimmt.

ZACHĘTY INWESTYCYJNE: ANALIZA NOWYCH MIEJSC PRACY, KORELACJA LICZBY NOWYCH MIEJSC PRACY A STOPY BEZROBOCIA

Niniejszy artykuł opracowano dzięki dofinansowaniu projektu w ramach Studenckiego Konkursu Grantów, realizowanego na Wydziale Ekonomii Uniwersytetu Technicznego w Libercu. W pierwszej kolejności ogólnie przeanalizowano zachęty inwestycyjne istniejące w Republice Czeskiej. Wymieniono wszystkie typy przyznawanych zachęt oraz szczegółowo przedstawiono proces wspierania tworzenia miejsc pracy. W dalszej kolejności analizie poddano nowe miejsca pracy stworzone w ramach wspartych projektów – pod względem liczby miejsc pracy w poszczególnych latach, pod względem liczby miejsc pracy w badanym okresie według regionów oraz branż przemysłu, w których miejsca pracy powstawały. Następnie nowo stworzone miejsca pracy analizowano według kraju pochodzenia inwestycji. W ostatniej części opracowania zdefiniowano stosunek stopy bezrobocia i liczby nowo stworzonych miejsc pracy. Stosunek ten określono przy pomocy testu zależności w oparciu o prosty model regresji.